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Translation

SOVIET SCIENCE AND TECHNOLOGY POLICY

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SOVIET SCIENCE AND TECHNOLOGY POLICY

This non-serial report contains selected translations of Russian articles on the planning and administration of Soviet research and development and the introduction of scientific achievements into industry.

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[I - USSR - O]

FINANCIAL PROBLEMS IN APPLYING NEW TECHNOLOGY

Tbilisi KOMUNISTI in Georgian 13 Sep 81 p 3

[Article by Candidate of Historical Sciences E. Batiashvili under rubrics "Scientific-Technical Progress is the Key to Advancement!" and "Prior to the GCP CC Plenum": "Science of Science: What Benefit Can It Give?"]

[Excerpts] "We must root out anything that complicates, delays, and hinders the adoption of innovations. This is extremely essential to the country, to the people....The integration of science and production is the urgent demand of our era."

In line with these program-oriented directives, the GCP and its Central Committee have made the strengthening and enhancement of the link between science and production one of the main thrusts of their economic policy. This is also attested by the fact that the GCP CC's coming plenum is devoted wholly to this vital republic and national problem.

Unfortunately, our party literature, and especially the social sciences, do not devote enough attention to the problematics of the scientific-technical revolution. This is due to the paradox that barely a handful of works on this unique phenomenon of the modern era have been published here--yet hundreds of titles on the subject are published in the USSR as a whole and in several union republics. Surely, investigation into the general-theoretical problematics of naukovedeniye and the sociological nature of science is the prime task of the social sciences! Another characteristic of the current scientific-technical revolution is the fact that it has incomparably multiplied the number of points of interface between the social and the natural sciences. The study of science, like prognostics, economic cybernetics, engineering psychology, mathematical linguistics, bionics, and ecology, has come forth as a natural result of this process.

Clearly, research into the variegated problematics of the study of science is important not only with respect to pure science and cognition [poznavaniye] but also yields great practical benefits. To comprehend all the problems and nuances of the scientific-technical revolution enables us to correctly pose and resolve the most important tasks of the building of communism.

This kind of comprehensive and integrated research is especially vital under the objective conditions of our republic, where the proportion of physically and morally obsolete means of production is especially high. The number of thoroughly mechanized and automated enterprises in the republic's economy adds up to only 8.1 percent; the comparable figure for the Soviet Union as a whole is over 20 percent. Some 53 percent of the republic's industrial enterprise workers are engaged in manual labor, and in agriculture the figure is 90 percent (the all-union average is 33 percent). Especially disturbing is this fact: the proportion of manual labor rose more than mechanized labor in the 9th and 10th five-year plans. Hence, a large portion of the growth in production output the past few years came not from rising labor productivity--that basic factor of economic development--but from extensive manpower factors, reserves of which are by no means inexhaustible. And all this despite the republic's traditionally high level of scientific-technical forces, despite conditions of the scientific-technical revolution in which there is no branch of knowledge, even the most abstract, which cannot find practical use. It is sufficient to recall the fact that in the designing of the Inguri GES Dam extensive use was made of shell theory, which was worked out by Georgian mathematicians. It is abundantly clear that for Georgia, the adoption problem--the integration of science and production--is even more urgent and essential. The interests of the republic's economy demand that it be swiftly and effectively resolved. The republic has all the necessary objective and subjective preconditions for it.

The problematics of the comprehensive development of the socialist economy constitute the subject of a recent all-union conference organized by the Znaniye Society in Moscow. It was emphasized there that the scientific-technical revolution, the essence of which is primarily reflected in the management of technological processes, poses the whole integrated problem of the dialectical relationship between science, technology, and production in a new way, and that the principles set down 45 years ago with regard to the relationship between science, technology, and production need to be radically revised. And the effectiveness of the relationships among the component parts of the scientific-technical revolution must ultimately be reflected in the growth of labor productivity and the return on capital return of science and technology. How vital and at the same time urgent it is to resolve this problem is indicated in the current state of return on capital both in the USSR as a whole and, in particular, in our republic. It must also be pointed out that statistics on the fondootdacha of science are often very contradictory and mutually exclusive; this, naturally, makes objective analysis difficult and complicates the formulation of correct conclusions and recommendations. According to V. Lebedev, for example, every ruble spent on scientific research pays back 28 to 31 kopecks. According to S. Golovskiy, the ratio is as follows: 1 ruble 0.57 kopecks [sic]; according to V. Trapeznikov, 1-1.45; I. Kurakov, 1-2.15. Even with the most optimal version of statistical calculation the payback does not exceed 5 units, even in the most advanced scientific-production associations. The world standard ranges from 40 to 50 units. All Soviet investigators of the scientific-technical revolution consider this low return on capital to be an alarming situation. As in the case of any phenomenon, naturally, this situation with regard to scientific capital return is due to a number of objective and subjective factors which require thorough and complete investigation. Such investigation is essential if the problem is to be correctly posed and solved.

Obviously, the successful building of communism depends above all on increased labor productivity. Just as obviously, this latter, in turn, depends on the mass adoption

of increasingly complex and highly productive automatic machines and tools in all spheres of the economy. Practice demonstrates graphically that the labor productivity growth problem is solved precisely where this process obtains. The adoption of production lines to process tea leaf in our tea factories boosted labor productivity by 33 percent overnight; the replacement of the old mechanical machines in fabric production by new automatic draw looms boosted textile workers' productivity by an unbelievable 250 percent. As we know, this factor accounts for 90 percent of the growth of labor productivity. We also know, however, that the rate of adoption of new technology, of materialization of completed scientific-technical work, is not keeping pace with the increasing requirements of the building of communism. By V. Lebedev's and G. Plekhov's calculations, moreover, speeding up the adoption process (average 7 to 8 years) by just one year could give the country's economy an economic effect of 5 to 6 billion rubles.

We still frequently encounter intolerable foot-dragging in the adoption of promising applications and thus have to spend a lot of money on foreign equipment and technology. The adoption of scientific discoveries is one of the most vital and crucial problems today.

L. I. Brezhnev's admonitions must become the firm guidelines of our scientific-technical cadres and party and economic officials in the 1980's and beyond.

It is theoretically incontrovertible that the ideal of linking science organically with production, permanent realization of the accomplishments of the scientific-technical revolution in production, must entail the creation of enterprises of the "plant-laboratory" type. Experience in the past few years has proved that the way to achieve this ideal is to create scientific-production associations (150 such associations have been created in the USSR, 5 in Georgia). Experience has also shown, however, that in this regard the union of science with production is more organizational than economic. Specific sociological surveys we have carried out indicate that both of the main partners in the adoption process, entrenched in the ways of their grandfathers, do everything they can to avoid the responsibility and "excessive burden" involved in the adoption of new equipment and technology. And, paradoxically, it is the scientific-research side which is the more conservative of the two. To attempt to rectify this situation by means of blatant administrative techniques alone will probably not yield the desired results but will only delay a serious solution to the problem. Therefore, in our opinion, we must think up effective forms of economic interaction between the enterprises and the scientific-research centers--including incentives for it.

The main defect in the present scheme of relations between science and production is that it artificially separates science from production and, however paradoxical it may seem, even sets them in opposition to one another. According to statistics, the disproportion [sic] in the financial funds allocated for scientific research and the adoption of its findings is in the ratio of 4:1; the task of speeding up the pace of adoption requires the opposite proportion. To "compensate" for this abnormal situation, only 4 percent of the bonus fund provided for the whole adoption process goes to the scientific-research institute, while 30 to 40 percent goes to the production personnel. Naturally, this places even more obstacles in the path of adoption.

New production facilities which are added to the title lists are also financed erroneously. Academician T. Khachaturov has calculated that the total estimated cost

of such enterprises in 1970 was 168.2 billion rubles, while the amount allocated yearly to build them was 14.1 billion rubles--constituting a minimum lag time of 12 years before these enterprises go into operation. Clearly, this kind of erroneous financing is also largely to blame for delays in adoption. The system of bank credit provided for enterprise development is also ineffective.

In order to accomplish full integration and cooperation of science and production, besides perfecting the financing system, it seems essential to convert to a unified and at the same time dynamic system of planning, cost accounting [khozraschet], and incentive. The various components of such a multidimensional economic system themselves demand that more attention be paid to local economic initiative, which must be based on the enhanced competence and responsibility of both economic-administrative and scientific-technical cadres. To do this it would seem expedient to create naukovedeniye departments (or at least sectors) in the larger scientific-production associations of Tbilisi--as is done in Moscow, Leningrad, and Kiev--to be responsible for working out concrete and detailed recommendations for effectively resolving specific problems of the association's social-economic development, from labor turnover to the study and comprehensive analysis of problems of adoption.

One very urgent problem that must be tackled in Georgian science studies is the investigation of the ways, techniques, and active role of the VUZes in the vital matter of technical remodeling of the republic's economy. As we know, most of our scientific forces--and in the future the absolute majority--are concentrated there. But so far the hard fact is that the VUZes are wrongly cut off from technical progress in production. And again, it is erroneous financing that fosters this situation: For every ruble allocated to the schooling process only 14 kopecks are allocated for research work--even though most theoretical and fundamental scientific-research is conducted in the VUZes. This disproportion is responsible for the fact that most of the VUZes do not have an experimental-production base or an effective incentive system. The same big disproportion is noted in the general funding ratio of scientific-research work: 96 percent of the budget-allocated funds go to the scientific-research institutes while 4 percent go to the VUZes.

One of the most urgent problems facing Georgian science studies involves the specific character of the region's economy: Because of general geographical and climatic conditions, Georgia has been an agricultural country from time immemorial. Its prosperity has always been, is now, and probably will continue to be determined by that fact. For this reason, industrial development as well will have to conform to this characteristic, with regard to priority development of agricultural equipment (especially that designed for mountainous terrain) and the processing industry. And the essence of the problem is that agriculture (and its associated processing industry) accounts for most of the heavy, exhausting physical labor in the republic. Yet under conditions of the scientific-technical revolution, reliance on extensive factors of production growth is an unpromising economic policy--if only because inexhaustible reserves for constantly increasing the work force do not exist anywhere, least of all in a small republic like Georgia. For this reason, the basic task of the republic's scientific-technical forces--a matter of prestige, in fact--is to shift agriculture's basic sectors and associated processing industry to a new technical track.

The job of adopting new scientific and technical ideas in production in a streamlined manner requires cadres of exceptional ability, experienced organizers of science and production. Quite often a good researcher or highly skilled production specialist

will lack administrative and management ability. Administration, management, is a profession, requiring particular human skills and qualities. Providing them requires the creation of a scientifically substantiated, effective system of particular techniques, particular means of study and practice; unfortunately, however, our system of specialist training does not pay enough attention to this matter.

The resolution of this problem is especially vital when we consider that with the passing of time the whole system of the national economy is growing increasingly complex and variegated, and science, technology, and production are becoming increasingly interrelated, as are the social-economic problematics of the science of science.

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ECONOMIC, PLANNING CRITERIA IN S&T DEVELOPMENT POLICY

Effectiveness of New Technology

Moscow EKONOMICHESKAYA GAZETA in Russian No 41, Oct 81 pp 4-5

> [Text] To conduct a consistent economic policy in all economic sectors for more rapid technical updating of production equipment, for the creation and manufacture of machines and equipment that permit improvement in labor conditions and increase in labor productivity, and for conserving material resources. To raise the technical level of accessory and service production.
>
> -- From "Basic Directions for the Economic and Social Development of the USSR for 1981-1985 and for the Period to 1990," approved by the 26th CPSU Congress.

The policy of intensifying production and increasing its effectiveness is making increased demands for the correct selection of alternatives for the design, creation, and utilization of new engineering and technology.

Modern science and technology open enormous possibilities for accomplishing various production tasks. But the same final result can be achieved by many routes. How can the best one be selected? How can scientific-technical innovations be correctly evaluated? Thousands of designers, engineers, and economic managers face these questions every day. The correct answer largely determines the growth in effectiveness of civil production.

For well-founded selection of new technology, the economic and social criteria shown in the acompanying diagram [not reproduced] are used.

In the evaluation of alternatives for new engineering and technology, preference is given to that which provides a high degree of economic effect. In other words, it takes into consideration the overall effect received by the manufacturers and consumers of products.

For determining the economy of the solutions, first of all, labor saving is taken into consideration -- the lowering of labor content in manufacturing products and also the growth in labor productivity in its utilization by the consumer.

At the Chirchik Transformer Factory, for example, without sacrificing reliability in large-dimension transformers, the technology for manufacturing reinforcing ribs for tanks was simplified. As a result, not only was a saving of 60 tons of rolled ferrous metals achieved, but also the labor content of the respective operations was cut by 2000 manhours.

Today, the economy of material resources -- raw materials, other materials, fuel, and energy -- both in production and in utilization, has important significance.

Designers at the "Kislorodmash" scientific-production association of Odessa, for example, in creating new machines and in modernizing equipment, are giving a large amount of attention to improving the specified coefficient of metal use. One of the sections of the scientific-technical council of the association is conducting the certification of machines and equipment according to metal content. Specialists have proposed a number of new processes for waste-reduced technology -- dragging, pressure treatment of metal, welding, cross-wedge rolling of stock -- in order to reduce metal waste. As a result, the weight of air-separating systems being manufactured has been reduced by 10 to 15 percent.

Large potentials for intensifying production and the growth in its effectiveness are related to the manufacture and use of highly productive equipment. Here, current practice is closely related to the development of certain areas. The most important of these is the growth of per-unit capacity of machines, equipment, and computer technology. For example, for thermal and nuclear power stations, there is an increase in the manufacture of generators with a capacity of 800,000 to 1.5 million kilowatts, which possess an increased coefficient of useful operation and a lower materials content.

Unique technology is being created for the Ekibastuz and Kansk-Achinsk coal basins and supercapacity equipment, for chemical and petrochemical technology. Of course, the utilization of technology of large per-unit capacities has proved to be economical where it is possible to load it fully and effectively.

And finally, economical results are inseparably linked with high quality and steady rise in the volume of products of the highest category of quality. They provide high effectiveness of production, fuller satisfaction of the demands of the economy and the population, and competitiveness in foreign markets.

The systematic renewal of products provides significant economic effect. From 1981 to 1985, at enterprises of the Ministry of the Electrical Equipment Industry, for example, there is to be assimilation of the production of about 9000 designated new items and, simultaneously, the removal from production of over 3000 designated outdated products. According to estimates, this large-scale renewal of products and the rise in their technical level will provide 7.5 billion rubles in economic effect.

Exceptionally important is the application of engineering technology and production and labor organization that will permit rapid recovery of expenditures. The calcu-

lation of the time factor under the conditions of intensification is the indispensable requirement of present management methods.

> The recovery of capital investments with reconstruction as compared with new construction is high. Thus, in the reconstruction of the Yakovlevskiy Linen Combine, additional capacities were introduced for 14,000 spindles for spinning and 794 looms, and the manufacture of Jacquard fabric and other high-quality products was assimilated. At the combine, the volume of production and labor productivity grew by a factor of more than 2.5, and the capital investment was recovered in two and a half years instead of the standard four years. The construction of a new linen combine with a capacity equal to the growth in production achieved would have required 55.6 million rubles -- more than the reconstruction project by a factor of 2.6

A high degree of economic effectiveness of engineering, technology, and products is an important, but not the only criterion for their selection for introduction into the economy.

It is no less important that they correspond to the high social demands placed on them by socialist society. The "Basic Directions" pointed to the necessity of bringing about profound transformations in the next decade in the most important sphere of people's lives -- their labor. It is a matter of improving and easing the conditions of labor, of providing broad possibilities for highly productive creative work, and to move significantly down the road toward eliminating existing differences between intellectual and physical labor and turning agrarian labor into various kinds of industrial labor.

This approach is obligatory in the development of any system of measures for raising the technical level of production and for creating and assimilating new products. Practically, it is a matter, first of all, that new technology be accompanied by improvement in labor conditions, that safety be improved, and that operations be made more comfortable. Its use must lighten the burden of labor, raise its level of mechanization, and make possible the growth of workers' qualifications. Finally, it is very important that this technology solve ecological problems, allow for the preservation of the natural environment, and improve the conditions of people's everyday lives.

Advanced collectives, in solving the problems of the technical re-equipping of production are giving a large amount of attention to the social aspects; this helps strengthen personnel, sharply reduce loss of work time, and increase workers' creative activity.

> The experience of Ivanovskaya Oblast enterprises shows that the implementation of great social measures in the course of rebuilding production has a favorable effect on all aspects of the life of workers' collectives. The introduction of progressive technology has changed the appearance of textile production. It is not just a matter of reducing manual labor, but also of improving a wide range of conditions in labor activity. Here, the fulfillment of require-

ments has been achieved for standards for temperature and humidity and for lighting. Living space at factories and combines has doubled.

As a result of the adopted measures, the turnover of textile personnel has gone down from 17.7 percent in 1970 to 12.8 percent in 1980. Morbidity has decreased by 12 percent, and occupational injuries, by 26 percent. The desire to increase knowledge and skill has been strengthened among the workers.

Planning New Technology

Moscow EKONOMICHESKAYA GAZETA in Russian No 41, Oct 81 pp 5-6

[Text] The revolution in science and technology requires cardinal changes in management style and methods and a decisive struggle against stagnation and conservatism, and a genuine respect for science, the ability and desire to seek its advice and take it into account. It requires improvement in planning and economic incentives so as to create conditions that will fully aid the most rapid transition of new ideas through all stages of development -- from invention to mass production, and that will put a reliable economic damper on the output of outdated products.

-- L. I. Brezhnev, in his report to the 25th CPSU Congress.

In raising production to the advanced frontiers of science and technology, an important role belongs to the consistent implementation of the decrees of the CPSU Central Committee and USSR Council of Ministers, adopted in accord with decisions of the 25th CPSU Congress, "On Improving Planning and Strengthening the Influence of the Economic Mechanism on Increasing Production Efficiency and Work Quality" (July 1979) and "On Improving Planning and Economic Incentives for the Production and Supply of Agricultural Products (November 1980).

The measures provided for in these decrees are strengthening the significance of the plan as a chief instrument of scientific-technical progress. A new system of plan indicators for associations and enterprises are directed toward the acceleration of this progress.

The number of confirmed plan indicators for scientific-technical progress has been expanded. In the five-year plans for associations and enterprises, in the sections on the introduction of new technology, basic tasks are being confirmed for the fulfillment of scientific-technical programs and for the development, assimilation, and introduction of new, highly effective technological processes and types of products.

In the yearly plans, tasks are being confirmed for the introduction of advanced experience in technology, work efficiency, production, and management.

Changes have been introduced also in the indicators of practically all sections of the plan for economic and social development. The purpose of this is to relate planned tasks more fully to the results of scientific-technical progress.

In the sections on production in the five-year and yearly plans, an indicator has been confirmed for growth in the production of products of the highest category of quality. Changes have been made in the system of natural indices for products that reflect more fully and precisely the economic effectiveness of these products, their technical level, and other consumer qualities.

The plan for labor and social development provides for tasks to reduce the application of manual labor. The implementation of these tasks has been tied to the broad introduction of progressive technology.

The plan for capital construction distinguishes indicators for the growth in capacity through technical re-equipping and reconstruction of operating enterprises, and also for expenditures for their technical re-equipping and reconstruction.

Confirmation of the economic effect from implementing scientific-technical measures is a new solution to the problem of organizationally including plans for the development of science and technology in the overall planning system. The new indicator strengthens attention to the development of progressive technical-economic norms and standards with consideration for the possibilities of scientific-technical progress.

To relate the plan for technical development of production organically to other sections of the five-year plan and to account fully in plans for economic effectiveness from the utilization of scientific-technical achievements, calculations of effectiveness must be done for the years of the period being planned for with consideration of the volume of introduction of new technology and needs for additional capital investments and for other expenditures. These calculations must reflect the influence of the introduction of measures for the basic technical-economic indicators of the five-year plan.

The introduction of new engineering and technology is included in the section of the plan on the technical development and organization of production. Here, the assimilation of new types and higher quality of manufactured products, the introduction of progressive technology, and the mechanization and automation of production are provided for.

Complex programs are developed for the solution of large individual tasks in the creation of and the organization of production for new types of products, for the application of progressive technology, for technical re-equipping, and for reorganization and expansion of production. The programs provide for efficient coordination of work among performers, time periods, and volumes in relation to the allotted material, labor, and financial resources.

An efficient means for strengthening the integration of science and production is the implementation of special-purpose complex scientific-technical programs. On the national economic scale, 160 such programs are being implemented; they provide for the broad introduction into production of scientific-technical achievements and the creation and utilization of specific pieces of effective engineering and technology. These programs cover the whole cycle of work, often going beyond the limits of the current five-year plan -- from the research stage to the creation of production capability and massive product manufacture.

According to estimates, the economic effect from introducing new technology as the result of implementing complex programs by 1985 will exceed 25 billion rubles.

For each piece of hardware manufactured for the first time in the USSR, a chart is prepared of the technical level according to the established form with its full technical-economic characteristics in comparison with the best domestic and foreign analogs or designs. The most characteristic technical-economic indicators are shown -- productivity, specific fuel consumption, specific materials and energy content, capacity, precision, indicators of reliability and durability, and planned cost and labor content per unit. For items of new technology in which inventions are utilized, the numbers of the authors' certificates protecting them are shown or the numbers of the claims for inventions on which positive decisions have been made for issuing authors' certificates.

> A system for certifying the level of technology and production organization has operated in the Ministry of the Electrical Equipment Industry for several years. The necessary organizational and technical measures are being developed on the basis of the results of the evaluation of the item being certified. Now, only 15.7 percent of the technological processes respond to the requirements of the highest category and over 10 percent are subject to replacement or radical improvement.
>
> The board of the Ministry of the Electrical Equipment Industry made a decision for all-out development of technological services and subunits for production training. For all groups within the sector, standards for the number of such subunits have been established. The technological level of production is considered in the formulation and utilization of incentive funds.
>
> During the current five-year plan, it is planned to introduce over 1000 mechanized and over 300 semiautomatic production lines at ministry enterprises. The quantity of automated control systems for technological processes is increasing to 60. Special attention has been given to the mechanization and automation of mass processes such as winding, insulation, and so forth. The fulfillment of complex programs within the sector will allow increasing labor productivity during the five-year plan by 30 percent and reducing the use of rolled ferrous metals by 16 percent, and other materials, by 11 to 20 percent.

During 1981 and 1982, an examination will be conducted of the technical conditions for products. Basic attention is given to the establishment of progressive norms and demand for product quality, for economy and effectiveness in the use of raw materials and fuel-energy resources, and for progressiveness of technological processes.

For control in the process of planning not only the lengths of time for gradual increase of production of new products, but also in the lengths of time for com pleting the manufacture of models and ending their service period, the plan for 1982 has included the subsection "Removal from Production of Outdated Products and Replacement of Backward Technological Processes."

Planned support for acceleration in the introduction of scientific and technical achievements must be supplemented by the active mass participation in this process by all workers, engineering-technical personnel, and economic specialists.

The economic motivation of enterprises has been strengthened for the creation and testing of experimental models. The cost of work of industrial character in assimilating and introducing new technology using funds from the unified fund for the development of science and technology is taken into account in the total volume of products with the allowance for standard profit. The preparation of experimental models and facilities is considered the same as series production.

A large amount of attention in state plans for the economic and social development of the USSR is being given to measures for further deepening of the process of integration and scientific-technical cooperation on the part of CEMA member countries.

Cost Accounting Basis

Moscow EKONOMICHESKAYA GAZETA in Russian No 41, Oct 81 p 7

[Text] Cost-accounting relationships are developing more and more widely among associations, enterprises, and scientific and design organizations.

The cost-accounting system for organizing work for the creation, assimilation, and introduction of new technology on the basis of commission-orders (or contracts) have been introduced at scientific-research, project-planning, and design organizations and at associations and enterprises. Commission-orders are becoming the chief form of planning within an economic sector. This provides continuity and comprehensiveness in planning. Commission-orders or contracts define the final project results, including the economic effect.

A unified fund for the development of science and technology has been created in the industrial ministries out of deductions of part of the profits received from the economic-production activities of associations and enterprises. Thereby, the volume of expenditures for science are tied to the results of the scientific-technical and economic-production activities of the ministry.

Funds for material incentives, social-cultural measures, and construction of living quarters, and organizational development, are being created at scientific-research, planning-design, and technological organizations.

The rewarding of workers at scientific-production and production associations, enterprises, scientific research institutes and design workers for the creation of new technology is made dependent on the total economic effect actually achieved in the economy from utilizing the achievements of science and technology. This system of incentives is aimed at high end results -- the rapid assimilation of new, effective technology in production.

The basic sources for forming incentive funds have been, first, deductions from profits formed at enterprises and associations within an economic sector by actually lowering the cost of products and and by fulfilling projects that utilize proposals by organizations for new scientific-technical solutions. Secondly, deductions are made from supplementary profit actually received by enterprises and associations of

an economic sector from incentive increments to wholesale prices for new, highly effective products and for products with the state Mark of Quality.

Funds included in the estimated cost of scientific-research, design, and technological work are also directed into incentive funds, if the economic effect from their introduction into production is not expressed in the form of profit from lower cost or supplemental profit from increments to wholesale prices.

The transition of institutes and enterprises to the cost-accounting system for work on new technology has been fully justified. This is borne out by the analysis conducted by the USSR State Committee for Science and Technology of six scientific-research institutes of various economic sectors that have been working for a long time under such a system. Thus, the proportion of work being done by the institutes in accord with the state plan increased during the years of the 10th Five-Year Plan from 29 percent to 40.2 percent.

The economic effect from utilizing research and development has grown at outstripping rates in comparison with expenditures. In 1980, the economic effectiveness of the activities of these scientific-research institutes reached 5.12 rubles per ruble of expenditure. The volume of products developed by the institutes and manufactured at enterprises of the respective sectors with the state Mark of Quality increased by a factor of 3.2

> The experience of the scientific and production collectives of the electrical equipment industry is also indicative. During the 10th Five-Year Plan, the application of the cost-accounting system for organizing work on new technology made possible a yearly growth in economic effect from the production and application of products in the sector of over 20 percent. In the total volume of production, the share of products with the state Mark of Quality achieved 47 percent here. In the current five-year plan, new frontiers are planned. The output of new items of electrical equipment has grown substantially. The economic effect from their production and application in 1970 was 403 million rubles, in 1975 — 934 million rubles, and in 1980 -- over 1.5 billion rubles.

As the result of the transition to the cost-accounting system, the time-lengths for conducting developments and introducing them into the economy were reduced. Thus, in the Ministry of the Electrical Equipment Industry, they went down on the average by 20 to 40 percent and, in the Ministry of Power Machine Building and the Ministry of Heavy and Transport Machine Building, by 30 percent. In individual developments, the time-lengths were reduced by a factor of 1.5 to 2.

Much has to be done to raise the success rate of scientific collectives.

> The experience of the Scientific-Research Physical-Chemical Institute imeni L. Ya. Karpov in strengthening the dependence of scientists' wages and incentives on the results of their activities deserves wide dissemination.

The collective of the "Gidroproyekt" institute is a good example of economic analysis and engineering investigation of optimum solutions. A careful analysis was

carried out here of the estimated cost of construction and installation work, indicators of hydroelectric power station operation, advanced experience in construction within economic sectors, and possibilities for domestic machine building.

> It was decided to lower the estimated cost of equipping the hydroelectric plants being built during the 11th Five-Year Plan according to the institute's designs by no less than 320 million rubles, 110 million rubles more than the task called for.
>
> It was intended to reduce the expenditure of cement in erecting dams by 370,000 tons (contrasted with a task of 170,000 tons) and rolled metal, by 110,000 tons (contrasted with a task of 50,000 tons).
>
> The collective pledged to reduce the planned labor to be expended in installing hydroelectric stations by more than 2 million man-days.

This experience was approved by the CPSU Central Committee and has been maintained by many collectives.

The introduction of new technology is the weakest link in the whole route from research to production: in the transition to the manufacture of new items, the profitability of production is temporarily lowered and organizational difficulties arise.

As practice shows, to improve the organization of work at the stage where new technology is introduced, the technical-industrial-financial plans of associations and enterprises should provide for all necessary resources (financial, labor, supplies, and equipment), including the necessary production capacities. The sources and scales of expenditures for introduction and assimilation included in the plan for new technology items should be determined, as well as means for economic incentives. Experience shows that it is useful, for each task involving the introduction and assimilation of new technology, to determine in the plan the extent of savings of all types of resources, the amounts for incentives, and also the conditions for their payment.

Associations, enterprises, and scientific organizations of the Ministry of Chemical Machine Building and the Ministry of Heavy and Transport Machine Building are developing standards, differentiated by the type of technology or technological process, for expenditures and scheduling of assimilation, for times for achieving designed technical-economic indicators, and for forming incentive funds. Such standards exclude the possibility of using new technology assimilation funds to compensate for losses due to deficiencies in work and mismanagement.

The relationship is being strengthened between rewards for basic results of administrative activity and the fulfillment of plans for creating and introducing new technology. With significant increase in the output of new, highly effective products for technical and production purposes and new consumer goods, enterprises are setting up increased standards for the formation of economic incentive funds.

Analyzing Effectiveness

Moscow EKONOMICHESKAYA GAZETA in Russian No 41, Oct 81 p 8

[Text] For a long time, the effectiveness of new technology has been determined, as is known, only during the process of technical-economic substantiation at the first stage of selecting a topic for inclusion in the plan. For this substantiation, the procedure for evaluating the effectiveness of new technology was simplified. Such an approach, along with the absence of subsequent control over the actual effectiveness of new technology often has led to miscalculations, to a shortfall in actual economic effect and, sometimes, to direct losses.

The planning of the economic results of introducing scientific-technical measures substantially strengthens the motivation to select new technology according to the criterion of lowering expenditures through the whole cycle per unit of work and productivity.

For the evaluation of the contribution of economic sectors, associations, and enterprises to increasing the effectiveness of civil production and for the selection of the most effective areas for scientific-technical development, the yearly economic effect is used as an indicator. It represents the total savings by the manufacturers and the consumers of new technology in all production resources (labor, materials, and capital investment) that are received by the economy as the result of producing and using new technology. In the final analysis, the savings achieved find expression in the growth in national income. The indicator is specified as a calculation in the five-year plan.

The growth in profit (reduction in cost) from the manufacture and utilization of new technology during the planning period is being used as a confirmed indicator of economic effectiveness.

In accord with the methodology being used, economic effect is determined as a difference in resulting expenditures.

> The calculation of the economic effect from replacing ferrous metal by vinyl in the production of water-gas tubing can be introduced as an example.
>
> The volume of production is 4 million linear meters per year.
>
> The cost of producing 1000 meters of tubing from ferrous metal is 80 rubles, from vinyl, 20 rubles.
>
> The specific capital investment for the production of 1000 meters of tubing from ferrous metals is 100 rubles, from vinyl, 200 rubles.
>
> The resulting expenditures for the replaced version were 95 rubles (80 + 0.15 X 100), for the new one, 50 rubles (20 + 0.15 X 200).
>
> In calculating the yearly volume of production the saving was (95 - 50) X 4000 = 180,000 rubles.

> The economic incentive funds for developers and manufacturers of the new technology (vinyl tubing) received, in accord with existing policy, 16.5 percent of the sum of the economic effect, that is, about 30,000 rubles.

In the analysis of the effectiveness of new engineering and technology, it is especially important to determine precisely what effect, expressed in cost-accounting indicators, is actually received from their creation and application.

This effect can appear in the reduction of cost and labor and materials content, reduced capital investment, increase in production volume, or improvement in product quality, expressed in increased labor productivity and reduction of operational expenditures by consumers. However, insofar as scientific-technical measures lead to changes in needs for labor, material, energy, financial, and natural resources, it is advisable to structure the calculation by deviating from the progressive norms for the five-year plan.

Such calculation should be done one time and should cover the entire cycle of "science-technology-production-application." Quantitative changes in expenditures for production and operation caused by the influence of new technology must be reflected in accounting documents and in forms for statistical accounting.

The recovery time for new technology measures on the average is 2.9 years -- significantly lower than the standard recovery time for capital investment of 6.7 years. At the same time, the effectiveness of the resources allotted for the development of the scientific-technical potential of the country must be significantly increased.

Indicators of the effectiveness of the activities of scientific organizations are improving, but at insufficient rates, according to data from investigations conducted by the USSR Central Statistical Administration on more than 1300 scientific organizations of almost 30 industrial ministries. According to the data from these investigations, the number of scientific workers in these organizations in 1979 compared with 1975 increased by 9.9 percent, and the volume of completed work, by 19.5 percent. The yearly economic effect from introducing developments rose by 21.7 percent. The number of introduced developments containing inventions increased. The quantity of inventions in the calculation for 100 completed topics was 46 in 1979 as against 27 in 1975.

At the same time, 68 percent of the introduced developments directed at creating new machines, equipment, devices, instruments, materials, and new technological processes did not contain inventions. The proportion of research and development the technical level of which is not evaluated by scientific organizations is still great. In 1979, it was 58.6 percent (as against 62.1 percent in 1975).

At all stages of the "science-technology-production-application" cycle, special measures must be taken to provide a high scientific-technical level of products; these must relate to the complex of measures for product renewal.

Statistical data indicate that, in the recent period, the renewal of the assortment of technology being manufactured in the country has been accelerated. But the volume of production of new technology often turns out to be insufficient.

At the present time, evaluations of the technical level are being conducted on items in various economic sectors; it is necessary to use the data from these in the development of plans for associations and enterprises.

The evaluation of about 19,000 types of industrial products being manufactured by enterprises of 21 industrial ministries has shown that almost a third of the product types require updating or removal from production in the near future. Thus, of 36 models of elevators being manufactured in the economy, five were recommended for removal from production.

In raising the technical level of production, the role of the mass rationalizers and inventors' movement is exceptionally important. As can be seen in the diagram [not reproduced], the number of inventions and rationalizers' proposals used in the economy grew significantly during the last five-year plan, and their economic effect increased by a factor of more than 2. Specialists, workers, and kolkhoz farmers at advanced enterprises -- the innovators of production -- actively participated in rationalizers' activities. This is a guarantee for the acceleration of scientific-technical progress and for the successful fulfillment of the tasks of the 11th Five-Year Plan.

9645
CSO: 1814/13

GEORGIAN ECONOMIST URGES COST ACCOUNTING FOR VUZ S&T RESEARCH ACTIVITY

Tbilisi KOMUNISTI in Georgian 9 Sep 81 p 2

[Article by Economics Candidate K. Elizbarashvili under rubric "Prior to the GCP CC Plenum": "A Time of Fundamental Breakthrough"]

[Text] Our Communist Party focuses constant attention on the creative development of science, in particular Marxist-Leninist theory. The concept of developed socialism has been worked out in recent years, in accordance with which, in L. I. Brezhnev's words, the paths and timetables of our further development have been made more precise and specific, and the strategy and tactics of the long historic period have been mapped out.

Further development of science and scientific-technical progress was the object of special attention at the 26th GCP Congress. As Comrade E. A. Shevardnadze emphasized in his address, "In the era of mature socialism, the creative power of spiritual values is growing.... Mines, factories, plants, kolkhozes, sovkhozes, farm complexes, plantations, and construction sites--these do not themselves constitute communism. We must build communism in the hearts and minds of men. And we cannot do this unless we make full use of spiritual values--literature, art, science, culture."

Science and scientific-technical progress are our tomorrow, participants at the republic's communist forum stated.

Now, as we know, the GCP CC has decided to devote its coming plenum to the tasks of the republic's party organization in regard to improving party and state supervision of science, accelerating scientific-technical progress, and putting scientific and technical advances to work in production.

In these days prior to the plenum, we must think and rethink about the vital problems facing our scientists and clearly designate their role and importance in the life of society.

As is well known, the Basic Guidelines of Economic and Social Development of the USSR for 1981-1985 and the Period Through 1990 deal with the question of enhancing the effectiveness of the cost-accounting [khozraschet] system both in the material production sphere and in scientific-research organizations.

Hence, in my opinion, it would be a good idea to place the VUZes generally, and their scientific-research activities in particular, on a khozraschet footing. I

think, furthermore, that it would be a good idea to introduce internal [vnutrenniy] khozraschet. This would serve to broaden and strengthen links between the VUZes and their corresponding sectors in the economy. It would help improve the system of moral and material incentive for the pedagogues.

I also think that in planning the training of specialists we should consider early (perhaps three- and five-year) assignment periods so that they are sent in plan form, in advance, to the VUZes and production outfits. This would undoubtedly improve the results of joint efforts by the VUZes and sectors of the economy and help advance scientific research.

A question of continuing concern is the coordination and concentration of individual science sectors. In my opinion, the creation of regional economies as a qualitatively new direction by no means entails that we must set up a new science unit (department or branch) in every rayon, oblast, and city. This serves merely to scatter forces and thus diminish the effect of scientific research. We need to make a careful study of the advisability of concentrating and coordinating currently functioning scientific-research institutes, laboratories, and departments of VUZes and, in particular, those subordinate to departments [vedomstva].

VUZ thematics undoubtedly need improvement. Lectures in the social disciplines must be made more problem-oriented [problemnyy] in character. They must reflect more clearly current issues of theory and practice, of problems of social and scientific-technical development. Lectures should above all ensure that the future specialist learns how to work independently.

In this regard, we must consider the role of Soviet statistics as a powerful tool of social understanding. Like a mirror, statistics clearly reflect our economic and cultural development patterns. As was reasonably pointed out at one of the GCP CC plenums, it is essential that we become thoroughly skilled with figures and categories, that we master thoroughly all the nuances of economic management, that we be able to speak, when necessary, in the language of statisticians and economists.

It is clear, therefore, that without the ability to summarize, analyze, and assimilate statistical data the VUZ student will have trouble mastering the social sciences. We ought to think seriously about the fact that some students don't even know, for example, the population and the area of Georgia.

The reason for this is that we, their instructors and professors, do not properly appreciate the role of statistics. We fail to replenish our arsenal of knowledge with up-to-date figures and data.

We must also keep in mind that because of the rapid development of science and technology, statistical data presented in the textbooks go out of date quickly. Keeping this powerful tool of understanding up to date, generalizing it, and making skillful use of it in the instruction process--these tasks ought to be of continuing concern to VUZ personnel.

Undoubtedly, the forthcoming GCP CC Plenum will undertake a fundamental turnaround with respect to problems of science and technology in the republic and map out the main thrusts of fundamental and applied research, and the plenum's decisions will serve as a program of our daily efforts.

6854
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VUZ ACCUSED OF OVERCHARGING FOR RESEARCH

Moscow EKONOMICHESKAYA GAZETA in Russian No 38, Sep 81 p 5

[Review of article in VECHERNIY VOLGOGRAD: "Under the 'Scientific' Trademark"]

[Text] The newspaper VECHERNIY VOLGOGRAD has come out with a sharply critical report, "Under the 'Scientific' Trademark." It says that, for a number of years, the Volgograd Polytechnical Institute has been engaged in scientific research projects on a contractual basis. During the past five-year plan, the institute's scientists have developed and introduced tens of interesting solutions, which have found wide application at city enterprises. But, at the same time, some laboratories and departments fulfill their contractual obligations at an extremely low scientific level and often substitute systematization of statistical data for creative investigation.

Characteristic of these plans is not only the standardization of structure, but also their isolation from reality. For example, in the long-range plan of the Volgograd Gas Equipment Plant, formulated by associates of the political economy department, labor productivity for the current year is understated as against the target approved by the ministry that is being successfully fulfilled. Such indicators as product sales, number of workers, and wage funds are also out of step. But the position of the developers on questions relating to improvement in the structure of the plant's staff seems especially strange. Thus, their plan contemplated a decline in the number of workers occupied in highly skilled labor by 1985 in comparison with 1980 and, on the other hand, foresaw a sharp increase in the number of unskilled workers.

There is yet another common peculiarity. In the drafting of each plan, the developers set an unjustifiably high price.

A senior scientific associate of the political economy department, G. Kogan, tried to explain the calculations for the cost of the work: 30 percent of the work cost was composed of developers' salaries, and the remainder was composed of expenditures for equipment. It turns out that the estimate included the acquisition of printing machines, photo-equipment, and imported tape-recorders. This is understandable. The only astonishment that remains is that regarding why the managers of the enterprises, whose duty is to safeguard state funds, signed these long-standing contracts with such ease.

9645
CSO: 1814/6

PERSONNEL PROBLEM IS 'CRUCIAL LINK' IN FUTURE S&T PROGRESS

Tbilisi KOMUNISTI in Georgian 22 Sep 81 p 3

[Interview with GSSR Gosplan Deputy Chairman Irakli Zhordania by Gruzinform correspondent R. Davydov under rubric "Prior to the GCP CC Plenum": "From Fundamental Discoveries to New Technology"]

[Text] The scientific-technical revolution requires that in the current five-year plan the development of science and technology be directed even more toward solving the most vital problems of intensification of production. What is being done along these lines in our republic? This was the question Gruzinform correspondent R. Davydov put to GSSR Gosplan Deputy Chairman and Lenin Prize Winner Irakli Zhordania.

[Answer] Before answering let me remind you that one characteristic of the present scientific-technical revolution is that it organically harmonizes the revolution in both science and technology. In contrast, the scientific revolution of the 16th century, the industrial revolution of the late 18th and early 19th centuries, and the revolution in the natural sciences early in the 20th century did not bring about a corresponding technical revolution. The scientific-technical revolution taking place today is a fundamental transformation of science and technology resulting in enhanced effectiveness of social production. What are the benefits of the scientific-technical revolution? The following figures make it graphically clear: three-quarters of the increase in industrial profit in 1980 came from the adoption of new equipment. Spending to adopt new equipment and technology is now recovered in 2 years and 9 months--at least twice as fast as capital investment. In the 10th Five-Year Plan, industrial sectors determining scientific-technical progress--chemicals, petroleum, electrical equipment, instrument making, and others--developed at an accelerated rate. This tendency is continuing in the 11th Five-Year Plan. The adoption of progressive technological processes, and mechanization and automation of production, is expanding substantially. Georgian industry now has about a thousand operating mechanized and automated production lines and more than 200 integrated-automated shops and sectors. All GESes are fully automated, and where necessary they are equipped for remote control. We didn't have any of this in the 1950's and 1960's. Automation has introduced qualitative changes in the nature of labor. It has made labor incomparably easier and more meaningful.

[Question] And is fundamental research at the basis of these accomplishments?

[Answer] Unquestionably. Samples of new equipment are being developed on the basis of advances in the applied sciences, and they are being adopted in production. At the development stage, science merges directly with technology and thereby takes shape itself, while new equipment and technology are put to work in production.

[Question] In short, then, we are proceeding from fundamental research to new technology?

[Answer] Yes. We have discarded the concept "pure science." If at one time science followed industry, now it is tending not only to catch up, but to take the lead. An enumeration of just the main channels by which today's fundamental sciences are merging with practice would be a long one.

In our republic, for example, chemists have created valuable new organic and inorganic materials on the basis of capital discoveries; they have worked out integrated techniques for producing valuable components and chemicals for agriculture from natural raw materials.

Substantial achievements have also been made in machine building, ferrous and nonferrous metallurgy, the mining industry, geology, industrial and civil construction, and ways to make rational use of drinking water.

Achievements in modern biology and genetics enable us to continue work on developing highly productive strains of agricultural plants and breeds of livestock. One of the newest economic sectors--the microbiology industry--is helping us greatly in the creation of a strong livestock feed base.

[Question] But even the scientific-technical revolution must encounter some obstacles in its triumphant progress. What might they be?

[Answer] The crucial link in the scientific-technical revolution is cadres. Cadre training requires a long-range approach. A shortage of essential cadres today is hindering the growth of science and the practical adoption of scientific ideas.

We lack qualified specialists for the petroleum industry, which is developing rapidly in the republic, also for ferrous and nonferrous metallurgy, mining, metal working, chemicals, and the electrical equipment industry. For this reason, much of the work in these sectors is being done by hand.

The lack of production engineers [tekhnologi] is even more acutely felt. We are having to have technical-profile engineers take their place, but this substitution is costly.

Conversion to automatic machinery and automated lines, programmable machine tools, computers, and control systems demands the accelerated training of adjusters, electricians, mechanics, pattern makers, and modelers who know electronics. Because we do not have skilled personnel in coal, manganese, woodworking, and nonferrous metallurgy enterprises, advanced machinery and automation devices are not operating to full capacity, and they soon go out of commission due to improper operation.

Cadre indoctrination is of vital importance to the state. The 26th CPSU Congress set forth this task: "Develop and improve night school and correspondence instruction." Sociologists tell us that raising the level of general-education training

from the 8th and 9th grades would speed up the mastery of new types of work by 50 percent. The labor productivity of night school graduates is 25 percent higher, and their on-job training and retraining takes 20 percent less time than in the case of those who do not have a secondary education. Today everyone is convinced that workers need a general education.

New technical-profile departments [fakultety] have been or soon will be opened in the technicums and VUZes. In addition, special training combines will be created in all big enterprises to train production workers in new technologies and equipment and upgrade their qualifications.

In conclusion I should like to repeat that scientific advances promise great possibilities in the optimization of production. But it takes human beings to realize them, and we must take prompt steps to train them.

6854
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COORDINATING ROLE OF S&T SOCIETIES

Moscow PRAVDA in Russian 24 Oct 81 p 3

[Article by Academician A. Ishlinskiy, chairman, All-Union Council of Scientific-Technical Societies and a Hero of Socialist Labor: "Champions of Progress"]

[Text] The country's scientific-technical societies unite over 10 million scientists, specialists, and workers and possess immense creative potential. Quite naturally, the decisions of the 26th CPSU Congress noted the necessity for strengthening the role of scientific-technical societies in improving production. This is the same sphere in which the paramount task laid down by the congress is being decided -- consistent improvement in the well-being of the Soviet people.

Scientific-technical societies are truly mass creative organizations, the public sector of science and technology, able to make a heavy contribution to the further improvement of the economy. Over 56,000 councils of primary organizations of societies have taken on the functions of technical-economic and production-technology councils for associations and enterprises. Nongovernmental scientific-research institutes, bureaus of economic analysis and technical information, efficiency councils, and other creative associations established within the framework of scientific-technical societies, revealed significant hidden reserves during the 10th Five-Year Plan for raising labor productivity and for saving fuel, electrical power, metal, raw materials, and other materials. There have been about 950,000 proposals relating to the further development of science and technology and to the practical application of their achievements.

One of the urgent areas for scientific-technical societies is the mechanization of heavy manual labor. With direct participation by the societies, measures based on the certification of manual labor have been introduced in republics, krays, and oblasts for the acceleration of this important work. Valuable experience has been accumulated in Belorussia, Latvia, Lithuania, and Chelyabinskaya, Kuybyshevskaya, and Zaporozhskaya Oblasts. Under the present five-year plan, still more progress must be made in this matter. Unfortunately, there are cases where certain operations at functioning enterprises are mechanized, but newly introduced operations are again done manually. Primary scientific-technical society organizations at project-planning and design institutions can and should avoid such a "revival" of an outlived orientation toward manual labor.

As is known, the 11th Five-Year Plan gives a large amount of attention to the improvement of special-purpose program planning. The USSR State Committee for Science and Technology, the USSR Academy of Sciences, and USSR Gosplan, together with interested ministries and agencies, have formulated 38 special-purpose scientific-technical programs and 112 complex programs for the solution of the most important scientific-technical problems. Specialized coordination councils have been formed, and the program directors have been confirmed.

In all this work, scientific-technical societies are actively participating. Coordination councils have been created in scientific-technical societies to support program fulfillment. In particular, under the All-Union Council of Scientific-Technical Societies there are coordination councils for reducing manual labor, for the development of mechanization and automation of lifting-transporting, loading-unloading, and warehouse work, for the creation of industrial manipulators, for conserving fuel and metal, for the production of consumer goods, and for other purposes.

Nongovernmental coordination councils also have been created in scientific-technical societies within economic sectors. For example, one scientific-technical society in agriculture has made its task the development and implementation of measures for increasing the yield of agricultural crops and productivity in livestock breeding. At the same time, it is no less important to preserve agricultural products in the process of transporting, storing, and sale. Much can be done here, especially by the scientific-technical societies of the motor-vehicle, railroad and water transportation, trade, food industry, semolina flour milling, mixed-feed and elevator industry, and the All-Union Chemical Society imeni D. I. Mendeleyev.

The progress of machine building is acquiring first-priority significance. "That which is advanced, which is created by scientific and engineering thought," noted Comrade L. I. Brezhnev at the 26th CPSU Congress, "machine building is called upon to master and to embody in highly effective and reliable machines, instruments, and technological policies."

The effectiveness of machines largely depends on their productivity, their reliability, and their durability. Repairs sometimes exceed many times the cost of machines and the time spent in their manufacture. In all, 40 billion rubles are spent yearly for the repair of machines, equipment, and transportation vehicles. Spare parts "eat up" a fifth of all metal smelted in the country. At the same time, the life of a machine can be prolonged noticeably without repair if its key subassemblies are improved on the basis of technological achievements and the science of friction and wear. Even if machines become more expensive, fewer of them will be needed and the use of metal will be reduced.

Unfortunately, there are many examples where factories limit expenditures for improving product quality because "superfluous expenditures" lower economic indicators. It might be useful to turn more widely to a system of having repairs done on a piece of technology by the efforts and means of the enterprise that produces it. Then factories would know more about the defects of their machines and would have more motivation to improve their reliability.

Skillful handling of a machine, its diligent maintenance, and its protection from corrosion mean much. Our primary organizations should teach this to operators persistently. For losses from corrosion amount to billions of rubles a year.

Under the All-Union Council of Scientific-Technical Societies, their administrative boards, and local councils, there are inter-sector committees on problems of wear-resistance and protection of machinery and equipment from corrosion, the automation of production processes, environmental protection, and other subjects. Their role in further improving our country's machine building keeps growing.

A large amount of attention by scientific-technical societies is required for the development of the productive forces of Siberia and the North of our country. Providing for year-round navigation, improving the operational characteristics of icebreakers, making bore-holes in shelf and permafrost regions, improving the reliability of technology that operates under the severe conditions of the North, and improving lubricants designed for low temperature -- all of this merits constant concern by scientific-technical society organizations.

The list of matters in which our societies are called upon to participate is very long. Literally every part of the Basic Directions for the Development of the Country has a direct relationship to a respective primary organization of some economic-sector society. And there are over 120,000 such primary organizations in the country. As a rule, they exist at each industrial and transportation enterprise, construction organizations, sovkhozes and kolkhozes, scientific-research and design institutes, and higher and secondary technical educational institutions. On this large scale, we cannot manage without close interaction with the USSR Academy of Sciences and union-republic academies, the USSR State Committee for Science and Technology, USSR Gosplan, ministries and agencies, enterprises and associations, the "Znaniye" Society, and the All-Union Society of Inventors and Rationalizers.

Many times, scientific-technical societies have shown examples of creative approach to the accomplishment of important tasks. Thus, the scientific-technical societies of Georgia have revealed initiative in searching out and using hidden production reserves, and the society of the Leningrad "Electrosila" association, in evaluating and raising the technical level of machines. Special urgency is being acquired by the initiative of a number of Moscow collectives in the wide utilization of scientific-technical achievements for conserving labor, materials, and energy resources, which was approved by the CPSU Central Committee. Utilizing the experience of the Capital's enterprises is the task of all scientific-technical societies.

Much of what has now become the property of large circles of scientists and specialists has been made possible through the large amount of aid and support of party organizations. The experience of creating scientific-technical society coordinating councils under party gorkoms has proved itself. The main success in this has been to achieve the unification of efforts by engineering-technical workers in important areas such as increasing production effectiveness and work quality.

The Basic Directions for the Development of the Country adopted by the 26th CPSU Congress, provides for strengthening the contribution of scientific-technical societies to the improvement of production. In this connection, the role of scientific-technical society complex creative teams, headed by scientists and engineers, should be expanded. It would be an oversimplification to reduce the functions of scientific-technical societies exclusively to that of supporting plan fulfillment. No less important is the solution of production problems which, for various objective reasons, are not being solved anywhere by anyone else. To have

a list of such problems is an important task of scientific-technical societies. Naturally, serious theoretical study of these questions, as well as the further development of mass technical creative work, is required. The attention of the All-Union Council of Scientific-Technical Societies was called to the necessity for this by the decree of the CPSU Central Committee and USSR Council of Ministers "On Strengthening Work in the Saving and Rational Utilization of Raw-Material, Fuel-Energy, and other Material Resources."

Scientific-technical societies have taken on this task with enthusiasm. On the initiative of a number of oblast and republic administrative boards of the All-Union Chemical Society imeni D. I. Mendeleyev, work has begun on taking stock of and making use of wastes from various plants, and complex measures are being planned for their full utilization. Thus, success has been achieved with participation by scientific-technical societies in the full complex utilization of blast-furnace and open-hearth slags at the "Azovstal'" plant. This produces valuable construction materials and fertilizers: granulated slag, pumice, ballast, and phosphate fertilizers. Just in 1979, over 3 million tons of pumice and granulated slag and 689,000 tons of fertilizers were sold to consumers.

The engineer is a central figure in scientific-technical progress. Serious thought must be given to how to expand the role of engineering services in production. The All-Union Council of Scientific-Technical Societies, together with state and economic bodies, needs to develop the necessary measures for this purpose.

Scientific-technical societies are a large, creative force. There can be no doubt that they will increase their contribution to the successful fulfillment of the tasks posed by the 26th CPSU Congress.

9645
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SOVIET SCIENTISTS MAKE USE OF INTERNATIONAL INFORMATION SERVICE

Minsk SOVETSKAYA BELORUSSIYA in Russian 26 Sep 81 p 2

[Report by Belorussian Telegraph Agency (BELTA): "A Compass in a Sea of Information"]

[Text] How much time does a scientist need just to compile a list of works conducted in the world for five years in such a narrow field, for example, as the application of nuclear methods of research in plasma physics? It turns out to be no less than half a year. That is, if one sits in a library and looks through catalogs. But one can also make use of the computer services of an international system of nuclear information, where all information on similar experiments is concentrated. In this event, a complete answer to the question will be received in minutes.

More and more often, specialists working in the fields of energy, physics, chemistry, geology, and medicine and scientists in other specialties are turning for assistance to INIS, as the system is called. The advantages provided by this operational service were described at the fourth scientific-methodological seminar of workers from republic and agency INIS centers in the USSR, which completed its work in Minsk on 25 September.

Every year our country introduces 12 to 13 thousand documents into the system and receives up to 70 thousand from foreign sources. Moreover, a third of the information, the speakers stressed, is completely unique, since it represents microphoto copies of research materials which are not offered for sale. Therefore, wide use by republic scientists of international information service, the functioning of which in our area is entrusted to the Institute of Nuclear Energy of the BSSR Academy of Sciences, opens up new possibilities for accelerating scientific investigation. This information allows avoidance of research duplication and aids determination of the more promising areas.

A. G. Romanenko, leader of the INIS section of the International Atomic Energy Agency, spoke before the scientists at the seminar.

9645
CSO: 1814/6

SUPPLY-MARKETING ORGANIZATIONS ENCOUNTER DIFFICULTIES IN AUTOMATION ATTEMPTS

Tbilisi ZARYA VOSTOKA in Russian 14 Oct 81 p 2

[Article by D. Kodua, head of the Tbilisi section of the All-Union Scientific-Research Institute of Economics and Organization of Materials and Equipment Supply: "When Computers Are Helpless"]

> [Text] At the present stage of development of our society, there has been an immense growth in the scale of production and in the ramifications and complexities of administrative relations, and scientific-technical progress has noticeably accelerated. Under these conditions, the rational organization of the system for materials and equipment supply, which is called upon to provide effective utilization of resources for the accelerated development of socialist production, will have exceptionally important significance.

Analysis of the structure and basic functions of the supply system shows that its information relationships are very complicated and the volume of information is reaching enormous proportions. If one considers that this information is processed unevenly during the year and that a large part of it has "peak character," it becomes understandable that it is impossible satisfactorily to accomplish the management tasks facing the system by traditional methods. The way out of the situation that has been created is to change the existing technology of collecting, processing, and distributing information by wide utilization of automated data banks, user dialog modes with computers, and networks of distributive information processing.

The most urgent problem in material and equipment supply is the timeliness and completeness of the resources being furnished for a given period.

This year, the Tbilisi Section of the All-Union Scientific-Research Institute of Economics and Organization of Material and Equipment Supply [NIIMS] is completing the drafting of a model complex of tasks for the planning and operational management of warehouse deliveries of metal products. The given complex, developed on an order from the Georgian Metal Supply and Marketing Administration, covers tasks relating to the forecast of needs by type, calculation of anticipated residuals at the beginning of the planning period, determination of optimum levels for commodity reserves, orders for products to supply and marketing enterprises, calculation for providing resources for consumer orders, verified replacement of scarce types of

products by less scarce types, acceptance of users' operational orders for implementation, and the formulation of monthly plans for product shipping.

Guided by the decisions of the 26th CPSU Congress and the decree of the CPSU Central Committee and the USSR Council of Ministers "On Improvement in Planning and Strengthening of Influence of the Economic Mechanism on the Increase of Production Effectiveness and Work Quality," material and equipment supply organizations are conducting a large amount of work to provide for fulfillment by producing enterprises and supply and marketing organizations of contractual obligations for the delivery of products in established volumes, time periods, and types.

On assignment from the Automated Control Systems Administration of USSR Gossnab, the Tbilisi Section of NIIMS is working on the task of automated control of product delivery to the most important construction sites and enterprises, using the Georgian SSR as an example. The aim of the work is to submit to Gossnab republic management the timely information that is necessary for making decisions on priority supply of material resources to the most important economic sites.

Operational management of material and equipment supply often confronts managers and specialists of the sector with the problem of selecting the best possible managerial decision. The consequence of an error in this situation is possible to assess only with the lapse of a significant amount of time, when it is already too late to avert the negative effects on the supply and marketing process. Imitative models of supply and marketing organizations are handy and flexible tools for forecasting the consequences of decisionmaking in similar situations; they permit estimating strategy for the conduct of the modeled object with fairly long-term probability.

The Tbilisi Section has worked out a dynamic probability imitative model for a "supplier -- base -- consumer" system which permits the thorough analysis of various algorithms for decisionmaking in the transit and storage process for supplying users in the republic and also permits the verification of many economic mechanisms for interaction between producers and users of products, on the one hand, and the material and equipment supply organizations, on the other hand.

It is necessary to go into some of the reasons for difficulties in the development of automated control systems and their effective operation in supply and marketing organizations. One of these is insufficient motivation on the part of developers and users of automated control systems for material and equipment supply in a high level of efficiency for the systems being developed. Analysis shows that the development of a majority of them is accomplished centrally and does not flow out of problem situations that provide incentive for creating automated control systems. At the planning stage, practically all of the work, including the organizational and technical preparation of the object for introduction, is fulfilled by the developers. They come before the sponsor and here, it appears, their role is somewhat like that of a troublesome petitioner who interferes with current work. When the project is put into operation, the picture sharply changes: Now the developers are very reluctant to respond to the needs and requests of users to provide necessary consultation or to work out defects in the system that are revealed after its introduction into operation. The possibility should be looked into for the transfer for a predetermined period of time, say, two or three years, part of the funds received from the economic effect brought in from the introduction of the automated control system, to a material incentive fund for developers and users of automated control systems.

The second reason is the acute lack of qualified specialists in the economic organizational analysis of the introduction site and in the statement of underlying automated control tasks, mathematical modeling of supply processes, and the programming and service of computers. The assignment to the organization-developer of the right for the temporary enlistment of the necessary specialists, on the basis of a labor agreement or dual-position holding, would allow planning to be done at a much faster rate and at a higher level of quality.

The third reason must pertain to the significant idle time of computers for technical reasons. For example, although the ES-1022 computer of the Tbilisi Section of NIIMS is located at the central service of the republic central office of the All-Union Administration of Computer Complexes, the latter, because of the lack of spare parts and the necessary number of specialists and because of the large pool of computers, often cannot provide the 90-percent coefficient of technical machine readiness guaranteed by contract. Emergency measures must be taken to improve the supply of components and subassemblies to the Tbilisi republic central office and to increase its work staff.

The fourth group of reasons stem from the low quality of formulation of the primary forms of documents (orders, warehouse accounting cards, and shipping invoices) in material and equipment supply organizations. The automated accomplishment of supply and marketing tasks on the basis of incomplete and distorted information causes distrust of machine documents by workers, makes practical operation more difficult, and requires numerous corrections to be made by hand.

And, finally, the fifth group of reasons is related to the fact that the automated control system projects being developed are oriented toward more perfect organizational structures, forms, and methods than those that are created in real situations. Such an approach is fully justified from the methodological point of view, since it is calculated on the fuller utilization of the potential possibilities of the automated control systems that provide the maximum effect with the highest level of control organization.

Therefore, in planning tasks for automated control systems for material and equipment supply, it is necessary to put into the system an ability to adapt to the above-mentioned conditions of reality in the economic system.

The rapid rate of scientific-technical progress and the broadening and increasing complexity of the tasks of economic reality are forcing the wide use of automated control systems. At the same time, one cannot forget that the automated control system is only a tool that increases many times the possibility for workers in supply organizations and brings maximum effect where efficient procedures have evolved locally and where analytical work being planned is organized with the information being received.

9643
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COORDINATING ROLE OF GEORGIAN ACADEMY OF SCIENCES

Tbilisi ZARYA VOSTOKA in Russian 21 Oct 81 p 2

[Article by N. Landiya, academician-secretary of the Georgian SSR Academy of Sciences: "Coordinating Scientific Research"]

[Text] Increasing the effectiveness of science today is directly related to improvement in the coordination of scientific research at all levels -- national, regional, republic, agency, and institute. The functions of the chief coordinators in the natural, engineering, and social sciences in the union republics have been entrusted to the academies of sciences.

Thus, the GSSR Academy of Sciences conducts comprehensive work toward improving the coordination of scientific research not only in the academy system itself, but also for the republic as a whole: it provides necessary assistance to VUZ's and to the nonacademy scientific-research institutions of Georgia in the organization and development of research on various urgent problems of contemporary science and technology, conducts joint work with many departments of Tbilisi State University, the Georgian Polytechnical Institute imeni V. I. Lenin, the Georgian Agricultural Institute, and other VUZ's of the republic, and has established close scientific contacts with many leading ministerial scientific-research institutes of the republic and production enterprises.

Many examples can be introduced of close scientific contacts and mutual coordination among institutes of the Georgian Academy of Sciences and the USSR Academy of Sciences, institutions of the union-republic academies, and also ministerial scientific-technical organizations. For a number of years, as an example, specialists of the institutes of physical chemistry, organic chemistry, and inorganic chemistry and electrochemistry of the Georgian Academy of Sciences have conducted joint work with scientists of the Leningrad "Gipronikel'" institute and the Institute of Chemical Physics of the USSR Academy of Sciences. On a number of important scientific and scientific-technical problems, joint work is being carried out by specialists of the Institute of Metallurgy of the republic Academy of Sciences, the Institute of Metallurgy imeni A. A. Baykov of the USSR Academy of Sciences, and the Institute of Electrical Welding imeni Ye. O. Paton of the Ukrainian SSR Academy of Sciences, and so forth.

The presidium of the GSSR Academy of Sciences gives special attention to the development and strengthening of close scientific contacts and cooperation with the academies of sciences of Azerbaijan and Armenia and to joint complex solution of regional scientific-technical problems. Basic areas for joint scientific research and a plan for scientific cooperation, which have been agreed upon among the academies of the three brother republics of the Caucasus, have been confirmed.

With the aim of successfully coordinating research, increasing effectiveness, and accelerating the utilization in the economy of the results of scientific research, the Council for the Coordination of the Scientific Activity of Scientific-Research and Higher Educational Institutions of the Georgian SSR is functioning under the presidium of the republic Academy of Sciences. Scientific problem councils (sections of scientific councils of the USSR Academy of Sciences, republic commissions, and so forth) on the most important problems of the natural, engineering, and humanitarian sciences have been created under the presidium and scientific departments of our academy; these councils represent the basic link in the activities of the coordination council. Problem councils systematically examine yearly and long-range plans for scientific research and higher-educational institutions of the republic in the natural, engineering, and social sciences. Projects approved by the council are entered into the summary plan for scientific research projects coordinated by the GSSR Academy of Sciences in the natural, engineering, and social sciences.

The basic condition for efficient coordination of projects directed toward the solution of large economic and scientific-technical problems is their thorough discussion by a wide circle of specialists and scientists. With this in mind, the presidium of the republic Academy of Sciences has organized a number of discussions pertaining to questions of constructing the Caucasian mountain-pass railroad, protecting the land and water resources of Georgia, autoclave-hydrometallurgical processing of Madneuli cooper and low grade Chiatura manganese ores, geological-physical research conducted in the Inguri River basin, the further development of agriculture in the republic, and so forth.

Recently, the presidium of the republic Academy of Sciences renewed the policy on the Coordination Council and scientific problem councils and on the composition of the Coordination Council and its bureau. The activities of scientific problem councils were examined from the point of view of the urgency of the problems being coordinated.

A number of scientific problem councils were abolished -- cases where the work did not correspond to the tasks given them or where the questions being covered by some of the problem councils had lost their urgency. Created were councils for the coordination of the development of a system for automating scientific-research work for collective use, the interagency problem council for the coordination of the use of lasers in science and technology, the interagency problem council for forecasting earthquakes under the GSSR State Committee for Science and Technology and the republic Academy of Sciences, the commission on the tea problem, the scientific council on energy problems, and others. Take, for example, the activities of the interagency problem council for forecasting earthquakes. It coordinates the work of a number of scientific-research institutions of the republic. Every year, the council examines the plans of institutions that participate in coordination and amends them before drafting the unified summary plan. Yearly reporting sessions of

the council are held regularly at which the results of scientific research are examined, the organization of work is evaluated, and recommendations are made for its further development. The council takes active part in fulfilling the special-purpose program "To Study the Regularity of Space-Time Changes in the Parameters of Geophysical, Geochemical, and Geodynamic Fields on the Territory of the Georgian SSR," and so forth. It also conducts work on the automation of scientific research with the aim of coordinating and further developing scientific-research and design work in this sector. Thus, problems have been examined relative to scientific instrument making and prospects for automation of scientific research in the Georgian SSR for the 11th Five-Year Plan and a working draft of a system for collective use of computing machines at the republic Academy of Sciences.

As we see, the activities of the coordinating council creates the possibility for increasing the effectiveness of scientific research for establishing more efficient coordination of the operations of scientific-research institutions, for exchanging experience and information . . . However, there are still many deficiencies in its work. Among them is the insufficient concentration of efforts of problem councils (Sections, commissions) on the fulfillment of the most important scientific-technical programs having national and regional significance. Also, they do not fully participate in the fulfillment of republic complex special-purpose programs. Problem councils do a poor job of informing, on the one hand, production organizations about achievements in fundamental and applied research and, on the other hand, academy institutions about the needs of production. The councils do an insufficient amount of work on the utilization by scientific institutions of the experimental facilities of large production organizations and scientific-production associations, and this is unpardonable, since this form for strengthening the supply and equipment base for scientific research is already used in other republics (the Ukrainian SSR, the Kazakh SSR, and others) and provides the opportunity for scientists and producers to cooperate.

The creative relationships with higher educational institutions and ministerial scientific institutions cannot be considered satisfactory today, either. Many of their projects are still not coordinated by problem councils. The activities of councils in creating and organizing the work of centers for collective utilization of expensive equipment and instruments are completely insufficient. The coordination council must practice more widely the conduct of field sessions with participation by specialists of the Academy of Sciences, VUZ's, ministerial scientific-research institutes, and production organizations of the republic; this will allow, in the final analysis, more efficient coordination of efforts for fulfilling joint projects and acceleration in the use of their results in practice and progress toward complex solution of important scientific-technical problems.

9645
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GEORGIAN SCIENTISTS INTERVIEWED ON REPUBLIC S&T DEVELOPMENT

Tbilisi ZARYA VOSTOKA in Russian 20 Oct 81 p 2

[Responses by T. Lezhava, deputy director of the Institute of Inorganic Chemistry and Electrochemistry of the Georgian SSR Academy of Sciences and a candidate of chemical sciences, and A. Dzhvarsheishvili, professor in the hydraulics department of the Georgian Polytechnical Institute imeni V. I. Lenin and an honored scientist of the Georgian SSR, to a ZARYA VOSTOKA questionnaire: "Improve the Training of Personnel" and "Interest Must Be Mutual"]

[Text] 1. What can facilitate more intensive development of the branch of science in which you work?

2. Are there realistic possibilities for improving the process of training scientific personnel?

T. LEZHAVA

1. The successful development of any science, including chemistry, depends on a large number of factors, which make up a unified, unbroken chain. It begins, in my view, with the selection and training of scientific personnel. Therefore, I will begin with the second question of the questionnaire.

If we are concerned about the future of our branch of science, it is necessary, first of all, for us to strengthen contacts between VUZ's and scientific research institutes. In implementing this requirement, we have gone the path, for example, of creating basic VUZ laboratories in our institute. We have the laboratory of electrochemical kinetics, in which students from the Georgian Polytechnical Institute imeni V. I. Lenin study the theory and techniques of conducting experiments. Contact between scientific-research institutes and general-education schools are very important.

In speaking about a system for training good scientific workers, we must say that a serious handicap is the rule in force today by which a formal graduate student can be directed only by a doctor of sciences. A candidate of sciences has the right to accomplish scientific direction only for advanced degree candidates who are not formal graduate students. In practice, a laboratory head who holds the degree of doctor of sciences tries to take on the direction of both the formal graduate

students and the degree candidates. This direction, however, is purely a formality: in practice, it is accomplished by so-called "microchiefs," that is, candidates of sciences who become codirectors, but even this often does not happen. Naturally, such an approach retards the creative growth of the "microchiefs" who are working on their doctoral dissertations. This is especially true when the work has an experimental character. The point is that the volume of experimental research that is necessary to complete a doctoral dissertation today is so great that it is simply not within the capability of one scientist. /Collective research projects are needed. In this case, the formal graduate student working on his thesis is a part of a wider research project conducted by a director and, together, they could become a tandem, able to accomplish both theoretical and experimental tasks/[in boldface].

2. As for the factors that make possible a more intensive development of science, especially applied science oriented basically toward the direct needs of production, a very important one that stands out among them is scientists' knowledgeability about the requirements of practice. At first glance, this statement seems obvious; however, one is often reminded that contacts between scientists and production enterprises are not very strong or effective. /It is necessary to find new organizational forms directed toward strengthening these ties/[in boldface]. Such a form, for example, might be periods of service at production facilities for scientists working in applied sciences: in spending some time at a specific enterprise, researchers have the opportunity to study its needs, as they say, from the inside.

Because of its own specific character, our institute basically is engaged in the solution of large problems that, for full realization, must end in the creation of a new shop and then a whole factory. However, the introduction of a new technological process that requires the creation of a shop is not a simple matter and often drags on for many years.

The introduction of such developments drags on for various reasons. One of them is that new technology requires obligatory testing under conditions approaching those of production, that is, under an experimental production variant. Many institutes, including ours, do not have such a capability. It is necessary to run to an enterprise for assistance. And if one considers that this stage itself is, to a certain degree, research, the necessity for revisions usually arise and sometimes extremely significant ones. All this does not in any way promote the arrangement of cooperation between scientists and producers. /The presence, then, of the institute's own base for large-scale laboratory testing would make this stage significantly easier and simpler and would permit more efficient work on individual subassemblies and more reliable data for designing experimental-industrial systems/[in boldface]. It must be noted that the low rate of introduction has a negative effect not only on the development of the economy but also on science itself. It weakens scientists' motivation towards applied subjects. For example, a proposal of ours of a process for continuous coking of so-called noncoking Tkibuli coal, on the development of which our scientists spent much time and effort, never achieved industrial implementation. If this development were to be introduced, the economic effect would be 15 million rubles. But this is not the only thing. If their research in this field could be continued, the scientists could improve this technology significantly. However, at the present time, investigations in this promising area are virtually turned off, and the laboratory has to reorganize for another subject. This, as we see, is a more than convincing example of the irrational expenditure of scientific potential.

A. DZHVARSHEISHVILI

1. Among the factors that retard the introduction of scientific developments into practice, the insufficiency of contacts today between scientific research institutions and production is justifiably named. This has not been avoided, unfortunately, even in hydraulics, that is, in a field of science where the applied aspect is especially predominent and this, in turn, is a negative indication of its development as a whole.

What, then, interferes with intensifying the introduction of scientists' achievements into practice? There are several reasons: on the one hand, there is a certain sluggishness in production. It was this way, for example, with the development of so-called rock paste, which represented considerable value to the economy -- it costs one-third or one-fourth as much as asphalt insulation and provides reliable protection for structures of metal, concrete, pipe, space, foundations, and machine tools from any corrosive environment. The paste is used at enterprises outside the republic, but in our republic it has not found wide application because our producers at the time were not interested.

Another reason for slow introduction is the lack of initiative on the part of scientists who are working on introduction. This is an example: two years ago it was established that a high-pressure water heater at the Tbilisi GRES, as at other thermal electric power stations, required the development and introduction of a reliably working system of hydraulic protection. On the initiative of "Gruzglavenergo" of the USSR Ministry of Power and Electrification, specialists from the hydraulic department of the Georgian Polytechnical Institute took on the solution of the problem. We had worked on analogous developments under contract for the Troitsk GRES in Chelyabinskaya Oblast. These developments, incidentally, will be introduced into practice by the end of the current year. And how are things going at the Tbilisi GRES? Here, everything has come to a standstill, only because scientists could not exhibit certain persistence in introduction.

More than sufficient examples can be introduced, but this would be unnecessary argument to show that workers of science have still not faced up to production. It goes without saying that to actively support the introduction of one's own developments into practice is not an easy task. In such a case, it is necessary to expend a lot of energy, effort, and time . . . It is true that the coefficient of useful activity of our efforts in this case would sharply rise if we were to give more attention to the development of well substantiated technical documentation and if we were to enlist the support of expert statements for the proposals being recommended for introduction.

/Very important significance, in my view, must be attached today to the development for every agency of an economic sector or large enterprises, of special purpose programs that pertain to the scientific-technical improvement of production through the introduction of new technology/[in boldface]. The basis for creating such programs must be objective information, accumulated as the result of work by complex teams of specialists -- scientists and producers, who, studying the bottlenecks of an enterprise or of a whole sector, are called upon to develop complex measures and to control their fulfillment. Such programs are already coming into being in Georgia according to plans developed by the republic State Committee for

Science and Technology. But their number is still obviously insufficient and they do not cover all economic sectors. We also have complex teams of specialists, which were mentioned before. However, their work often has a formalistic character and does not help matters much. Planning should be the basis for revealing the needs of the economy. The Georgian SSR State Committee for Science and Technology, the Academy of Sciences, and the management of republic ministries and agencies must Take care of this.

/The organization of solid, practical interrepublic and lower-level relations will help increase the creative output of Georgian hydraulic scientists/[in boldface]. We have something to learn from Azerbaijanian specialists in the developments of the technology of deep drilling for petroleum, from Armenian scientists in the field of hydrotechnology, and we also have achievements and experience that can be shared with colleagues.

Attention must also be given to the creation of a scientific-technical journal and an organization of information firms, on a nongovernmental basis, which would engage in the collection of single-purpose and topical information on the problems that arise systematically in any branch of science. It is important to set up efficient coordination of work between republic scientific-research institutions and VUZ's, on the one hand, and related or closely allied organizations in the country as a whole, on the other hand.

2. Today's engineer must possess a "solid store" for the future -- a store of theoretical knowledge that will permit him to create and to creatively absorb new technology. Therefore, student years for our young people must be not an approach to the subject, but the mastering of it. I am disturbed by the rate of flow of young people into science. Take the 1950's, for example. Then, we accepted five or six people every year for formal graduate training in our specialty. And the competition was high. Now, the situation has sharply changed: one or two graduates from our VUZ are accepted in formal graduate training, and there is no competition. A way out of this situation can be found, in my view, by sharply intensifying the activities of student scientific societies and by working out individual plans of study for students with the most promising abilities.

9645
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GEORGIAN S&T INFORMATION SYSTEMS DESCRIBED

Tbilisi ZARYA VOSTOKA in Russian 23 Oct 81 p 2

[Article by S. Dadunashvili, chief engineer of the Georgian Scientific-Research Institute for Scientific-Technical Information and Technical-Economic Research and a candidate of engineering sciences: "So That a Document Does Its Job"]

> [Text] Scientific-technical progress, which at the present time is penetrating practically all spheres of human activity, has created unprecedented torrents of information. This fact has required more profound attempts to understand information processes and the introduction of mechanization and automation into the information sphere.

It can be stated with confidence that in this field the technology is just as important as it is in the sphere of industrial and agricultural production, although it differs significantly. The urgency of these questions can be emphasized by the following fact: at least a third of the work time of researchers, project planners, designers, and administrative and management workers goes into the search for the information, documentation, guidance, and other materials needed by them.

Can these losses be avoided or at least reduced? Advanced experience that we have accumulated in this country delineates two interrelated areas in accomplishing this task: model organization of information support and raising the level of the "information awareness" among information users. The relationship between these areas is particularly evident at the present time, when technology has begun to be widely introduced into the information sphere. First of all, there are reliable, precise, and fast machines, which provide the functions of collecting, processing, storing, searching, duplicating, transporting, and distributing information materials.

These functions are being realized most widely with the help of computers. However, the logic of the system approach dictates the necessity for introducing computers simultaneously with the introduction of simple technology which, as is known, is already beginning to be used at the specialist's work place.

This simple technology consists of many types: word processing for drafting textual documents and correspondence, coding and duplication of documents, binding and stitching work, work-place equipment, tools, aids for graphics, and the means for reference-information service. Various combinations and complex utilization of

these allows the creation of information-search systems for various purposes. As practice has shown, these information-search systems are more effective with local application: in scientific-research and design organizations and in low-level and middle-level administrative management links, where the volume of circulating information is relatively small.

One of the pioneers and promoters of developing and introducing such local systems in our republic has been the "Proyektbyuro" special design bureau in Kutaisi. Positive experience in using these systems has been accumulated at information centers of the Kutaisi gorkom of the Georgian Communist Party and the Kutaisi ispolkom of the city Council of People's Deputies. The information center of the city ispolkom, for example, accomplishes the receipt of everyday information on basic areas of work of its administrations and sections, accomplishes the processing and storage of the information received on special punched cards, does accounting on operational information received, accomplishes the transmission of everyday assignments to services of the ispolkom management, the processing and storage of information pertaining to questions examined at ispolkom meetings and city council sessions, and also at various commissions, the collection and processing of necessary information on personnel, the conduct of operational controllers' meetings, and others. The center efficiently gives out requested information from all of the stored and processed data.

It is necessary to note that good experience in the use of information-search systems on punched cards has been accumulated in the Baltic and in Moldavia. Unfortunately, however, many workers today still have not recognized the necessity for using information-search systems, particularly on the basis of punched cards.

The traditional technology for work with information materials amounts to receiving the necessary information and transmitting it to specialists without preliminary introduction of the data into appropriate information-search systems for its subsequent repeated use. From information materials, specialists create traditional files, in which finding anything needed becomes simply impossible with the passage of time. The rational organization of information support with utilization of local information-search systems permits removing this problem, providing the possibility of systematizing with maximum integration, accumulating, sorting, storing, for long periods for repeated use, documentary information (textual or graphic). They provide the possibility for forming and putting in order their own growing document collections at lower and middle levels, where an absolute majority of information needs of the country (over 90 percent) arise and are satisfied. Each year, the traditional libraries that exist at these levels are becoming more and more unmanageable. Local systems are extremely compact and can be brought into maximum direct proximity to the work place of information users. One can mention here both simple systems that apply perforated-edge and hole-punch cards and more complicated systems such as aperture cards and 80-column machine cards, all of which have received wide use.

As a whole, these systems can double the growth of productivity and increase the effectiveness and quality of work.

Computer application at local information centers, as well as in the case of small- and medium-sized industrial and agricultural plants cannot be considered expedient

for all times and in all places. Only in large information centers, where they will be fully utilized, can computers reveal all their potential possibilities, particularly for information-support purposes. An information center of this type in our republic is the Georgian Scientific-Research Institute of Scientific-Technical Information and Technical-Economic Research [GruzNIINTI]. GruzNIINTI, which is a link in the state scientific-technical information system, coordinates its activities with other institutes of this system in the country and supervises the circulation of scientific-technical information in the republic. The institute serves under contractual arrangements over 200 enterprises and organizations per year on the average and puts out over 400,000 copies of information materials. It organizes together with the republic scientific-technical library a unified republic reference-information collection with consideration of the special characteristics of the Georgian SSR economy.

GruzNIINTI is continuously developing, the volume of information service is growing, and its forms and methods are improving: the processes of information search, storage, and transmission are being automated. This is taking place on the basis of up-to-date technology, new printing, microfilming, and computer equipment. On the basis of these, a republic automated system of scientific-technical information has been created and is developing. In the future, the system will work in close interaction with a network of automated scientific-technical information centers in this country and abroad.

It is necessary to note that the technology for document processing in the republic automated system for scientific-technical information includes the promising process of microfilming. At the present time, an analogous technological process is also being introduced at the computer center of the Georgian SSR Council of Ministers.

To accomplish a majority of the tasks that face information support to scientific-technical progress in the republic and to increase the effectiveness and improve the quality of information work, it is necessary first of all to unite at one center, applying a single technology, the management of all scientific-technical information channels. Because of this, the effectiveness of using computer, microfilming, and printing technology is expanding significantly, and the utilization of the technology base is improving.

The question of improving the system for training and for raising the level of "information awareness" has become pressing both with respect to information-service workers and with respect to information users. Of course, the best information service does not exclude the possibility of making bad judgments; however, it can be affirmed that poor formulation of information work leads and will lead to bad judgments. More simply, a document not found in time, as a rule, is unfulfilled work.

Model information service increases the value of a document as an information carrier, a source of data for making a correct administrative or scientific-technical decision, and increases executive discipline, and all this, in the final analysis, leads to savings in workers' time and to the increase of labor effectiveness.

9645
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GEORGIAN ECONOMIST TRAINING HAMPERED BY SHORTAGE OF GRADUATE STUDENTS

Tbilisi KOMUNISTI in Georgian 18 Aug 81 p 2

[Article by Professor Dr of Economics V. Advadze, deputy director for science in the GSSR Gosplan's Scientific-Research Institute for Economics and Planning of the National Economy, under the rubric "Prior to the GCP CC Plenum": "To Get Better Results. Economic Science: Organization, Tasks, Cadres"]

[Text] We live in the age of scientific-technical revolution.

A hallmark of the scientific-technical revolution today is the increasingly extensive adoption of man's enormous intellectual achievements in various spheres of economic and social life, especially in production. Science is merging organically with production and thus becoming a direct force of production. As a social institution, science has become a vital factor in the country's social-economic potential.

The volume of scientific endeavors, in particular scientific discoveries and information, doubles in approximately 10 to 15 years. The number of people employed in science is growing rapidly.

Under present conditions, scientific development requires huge expenditures. In view of this, the Soviet state, pursuant to its policy, allocates the necessary funds. In 1940 this funding came to 0.3 billion rubles; in 1976-1980 it averaged 19.4 billion--a 64.6-fold increase between 1940 and 1980, compared with a 17-fold increase in the country's overall budget expenditures. This is only natural. Calculation shows that investments in research and development are 3.5 to 5 times more effective than ordinary capital investments. This is why the party pays special attention to scientific development, practical adoption of scientific advances, and science cadre training.

Scientific development, scientific-technical progress, and practical adoption are always at the center of the GCP's concern. This is attested by the fact that the GCP CC's next plenum will be held in September of this year to discuss matters involved in perfecting the party's and government's management of science, accelerating scientific-technical progress, and putting scientific and technical advances into production.

Georgia's scientific potential is an organic part of our homeland's scientific potential, and our scientists are among the leading units in the huge army of Soviet scientists. There were 25,300 scientists in Georgia in 1980--7.2 times more than in

1940; 5.3 percent of the total were doctors of science, while 35.9 percent were candidates of science. Comparable all-union figures were 2.7 and 28.8 percent. Thus, the qualitative make-up of our republic's scientific cadres is rather high, exceeding the all-union averages. This accounts for the GCP CC's demand that the maximum effective use be made of our scientific potential.

Economic scientists make up 4.8 percent of Georgia's scientists. Of the total, 44.5 percent are doctors and candidates--higher than the republic average. They are employed in the VUZes and the institutes of the Academy of Sciences as well as sector scientific-research institutes.

The object of Georgian economic scientists' research comprises the economic and social problems of developed socialism and the laws governing its transition to communism, topical matters of enhancing the effectiveness of social production, improving the planning and management of the national economy, and the most important economic sectors.

The center of focus of GSSR Gosplan's Scientific-Research Institute for Economics and Planning of the National Economy is the integrated-goal-directed [kompleksnaya-tselevaya] program "Georgia-2000 Regions," the drafting of proposals for the basic guidelines of the republic's economic and social development (by regions), matters of the theory and methodology of economic planning and management, and problems of perfecting the economic mechanism. Extensive research work is underway on implementing the party's and Soviet government's 12 July 1979 decree on improving the economic mechanism. The scientific principles of converting industrial enterprises to autonomous financing [khozraschet] are being formulated; studies are being made of enterprise and association experience in drafting counter plans, also brigade forms of labor organization and wages in the republic's industry and the factors that cause industrial enterprises to operate at a loss. Measures are being worked out to generalize and disseminate the leaders' experience, liquidate unprofitability, and so on.

The institute's scientists' group has carried out an experiment of economic incentive to improve product quality in Tbilisi's Isani Footwear Production Association, and the results are encouraging. We have worked out recommendations on adopting internal autonomous financing [vnutrennyy khozraschet] in the Tbilisi Silk Production Association, the Gori Cotton Goods Production Association, and elsewhere. Other research establishments working in economics have also made substantial contributions.

Despite these accomplishments, we are not making full use of our republic's scientific capabilities. As Comrade E. Shevardnadze remarked at the 26th GCP Congress: "It must be stated, with full party frankness, that our science--our scientists, specialists, and designers working in the sciences and scientific service spheres--have not done everything they could have to accelerate the enhancement of our republic's and our whole country's economy." This statement applies as well to us in economic science, owing to still persistent shortcomings in the selection of science thematics, their organization, and scientific cadre training.

It has been noted frequently at recent GCP congresses and GCP plenums that Georgia has a huge economic potential, huge production capacity and fixed capital, and reserves for production intensification, which have yet to be fully utilized. In this respect the work of our scientists has not yet assumed the proportions that are

essential to discern these reserves and put them to work to boost production. Thorough formulation of these problems, broad research and analysis of underlying processes in the republic's economy, generalization and the formulation of conclusions, and the drafting of practical proposals and recommendations for leadership organs in order to implement them--these are the prime tasks of Georgia's economists.

Questions relating to capital investment and labor resource effectiveness, and wages in various sectors of the economy, have yet to be dealt with adequately. Our efforts with respect to working out pr blems of economic management are not satisfactory. Only recently have we begun to study matters of the economics and effectiveness of science and make the first predictive calculations of scientific and scientific-pedagogical cadre requirements. We have not dealt with the economics of education, including higher education. The economics of many sectors of industry and the national economy still await scientific investigation.

A serious shortcoming of the research work in the field of economics is the paucity of integrated themes, the plethora of petty themes. To be sure, some effort has been made in recent years to ensure more substantial themes, but a look at the research plans of the research establishments convinces us that this effort is a mere formality in many cases; subthemes deriving from main themes differ radically from one another--they are completely distinct and have been placed under a single rubric in a mechanical and superficial manner.

A major shortcoming of the research is the fact that some of the completed work is rather low in quality, and there is a paucity of practical proposals and recommendations.

A shortcoming of the scientific work in economics is the poor coordination among scientific-research establishments. Until recently, in fact, more themes were completed in coordination between the scientific-research establishments of Moscow and the union republics than, for example, the five economics faculties of Tbilisi University, or among the various research establishments inside the republic.

Another shortcoming is the fact that recommendations and proposals that have been drawn up are not put into practice.

There are serious defects in the planning of dissertation thematics, which do not always reflect the tasks of developing the most promising directions in science and technology. The formulation of dissertation thematics lacks coordination. Frequently the dissertation theme is determined by the degree candidate himself, or his supervisor, rather than reflecting the research establishment's research work plan.

There are a number of other difficulties and shortcomings in the training of qualified cadres of economic scientists. The negative phenomena of the recent past also had an adverse effect on the training of science cadres.

People have been reluctant to enter graduate school lately. Graduate students' and young science workers' pay is less than satisfactory. A young specialist with a job in production is in a much better position (in terms of pay, housing, and so on) than a graduate student or a young science worker without a degree. The need to publish, and the requirement to have one's findings adopted in production prior to defense of the dissertation, account for the rise in the number of graduate students who have completed their coursework but failed to submit their dissertation on time.

A particularly grave situation has developed in the 11 regional "economic and social problems departments" of GSSR Gosplan's Scientific-Research Institute for Economics and Planning of the National Economy. They have been staffed chiefly by non-degree-holding specialists (or are in the process thereof), and for their further scientific growth it is essential to renew acceptance into the institute's graduate program, which has been halted since 1970. A number of petitions submitted for this purpose to the USSR Ministry of Higher and Secondary Specialized Education have so far proved unavailing.

There are many other matters having to do with the development of economic science and the training of cadres of economic scientists; these need to be thoroughly studied and resolved.

At the 26th GCP Congress, Comrade E. Shevardnadze stated that further intensive development of science and scientific-technical and social-economic progress constitute the GCP's prime task in the 1980's. We believe that eliminating the above-mentioned shortcomings in economic research will serve to enhance, activate, and intensify scientific endeavor, and thus yield better results.

6854
CSO: 1813/019

ALL-OUT EFFORT ON 'BIOTECHNOLOGY' URGED BY GEORGIAN ACADEMICIAN

Tbilisi KOMUNISTI in Georgian 26 Aug 81 p 2

[Article by GSSR Academy of Sciences Vice President S. Durmishidze under the rubric "Science in the Vanguard of Social Progress": "Broad Scope. Prospects of the Development of Physical-Chemical Biology in Georgia"]

[Text] A few days after the publication of the GCP CC's letter of 22 July 1981 it was announced that the CPSU CC and the USSR Council of Ministers had passed a decree on the development of physical-chemical biology and biotechnology and the adoption of their accomplishments in medicine, agriculture, and industry. The decree calls for the creation of conditions specifically fostering the development of these disciplines in the Soviet Union and significantly enhancing their role in accelerating the country's scientific-technical progress. The decree states that one of the most important tasks of Soviet science at the present stage is the scientific study of the physical and chemical principles governing life processes, a study which must be broadened and deepened.

Physical-chemical biology encompasses molecular biology, bio-organic chemistry, molecular genetics, biochemistry, and biophysics. In some of the most important sectors of these disciplines Soviet science is a world leader.

Georgian scientific research into physical-chemical biology has also been expanded and deepened significantly in the past 10 years. Highly qualified cadres have been trained and an appropriate experimental base created. There are real prospects for strengthening research work in the field.

The physical-chemical principles of life processes are being studied in the GSSR Academy of Sciences institutes of physiology, plant biochemistry, physics, pharmacochemistry, botany, zoology, and physical and organic chemistry, the Tbilisi State University's departments of biochemistry and biophysics and problems laboratories of molecular mechanisms of cancerogenesis and photosynthesis, the Georgian Medical Biophysics Center, and other scientific-research institutes and training institute departments.

Last June the Plant Biochemistry Institute held a republic scientific conference on enzymology, dedicated to the 60th anniversary of the establishment of Soviet rule in Georgia and the creation of the Georgian Communist Party. It was participated in by 15 scientific-research and training institutions. The plenary session heard my own paper, "The Development of Physical-Chemical Biology in Georgia." Georgian science

has made outstanding contributions to the study of the physical-chemical foundations of life. One newspaper article cannot deal completely with all these accomplishments, but Georgian scientists' achievements are indicated by the fact that four institutes of the GSSR Academy of Sciences (physiology, plant biochemistry, genetics, and experimental morphology) have contributed 15 themes to all-union plans for the development of molecular genetics and molecular biology in 1981-1985.

It is essential that our republic strengthen and deepen the investigation of well-defined and well-coordinated problems in physical-chemical biology. Only on the basis of such highly scientific research can we implement the 26th CPSU Congress decree "Make Use of Highly Productive Varieties of Plants, Animals, and Valuable Microorganism Cultures and Develop New Physiologically Active Substances, Including Pesticides."

As is noted in the decree, the promising scientific-technical field of biotechnology is coming into being on the basis of advances in physical-chemical biology. Biotechnology encompasses a number of scientific disciplines, new methods and techniques of research and production: technical biochemistry, microbiology, genetic engineering, the use of animal and plant cell cultures, and the use of immobilized enzymes.

Of the various fields in biotechnology we will here deal at length only with technical biochemistry, inasmuch as it is traditional and particularly essential at present for our republic.

Technical biochemistry constitutes the basic theoretical foundation of food industry development. Its main tasks are these: to determine the technological and food qualities of the raw materials, to work out the biochemical principles of raw materials storage, to study the biochemical processes taking place during food manufacturing in order to control them and streamline production, to obtain enzyme compounds to use in making food products, to find new raw materials and develop the production of new types of food products, and to determine the biochemical principles of utilizing wastes, secondary raw materials, and by-products.

The main shortcoming in the development of technical biochemistry at present is that not enough attention is paid to the study of general problems; researchers in the field are not making full use of advances in physical-chemical biology.

It is possible to find the most rational solution to the problem of obtaining top-quality food products only on the basis of a thorough understanding of physical, chemical, and biochemical processes taking place in production mixtures [smash], which will enable us to direct production in the desired manner.

In December 1980 the Plant Biochemistry Institute held a republic scientific conference on technical biochemistry. Participants heard papers [illegible] not only by scientists but also by officials of the republic's food industry, ministers and heads of industrial associations. A general discussion of problems concerning the quality of almost all products of the food industry clearly delineated the general tasks facing our science and production workers in the 11th Five-Year Plan. Tea, wine making, the canning industry, and meat and dairy goods production are all urgently awaiting scientific solutions to many problems.

A very promising direction in medicine, agriculture, and the food industr is the use of immobilized enzymes and cell cultures, genetic engineering. Stepp.d-up efforts along these lines can yield radically new raw materials, new technologies, new physiologically active substances, and new food products.

One of the most pressing tasks facing Georgian scientists is to step up scientific research into biotechnology, both in academic and sector institutes, to take the lead in developing this line of endeavor and create a firm scientific foundation for implementing our food program.

Georgia's health, food industry, agriculture, and other republic ministries are well served by strong and respected sector institutes, and given the appropriate help they can achieve further advances on the basis of development of physical-chemical biology and biotechnology in Georgia.

All the scientific disciplines and techniques that make up biotechnology contribute to the task set forth at the 26th CPSU Congress--"to work out biotechnical processes for the production of products to be used in medicine, agriculture, and industry."

With respect to the CPSU CC and USSR Council of Ministers decree, of course, each republic must define the means and pace of development of physical-chemical biology and biotechnology according to specific conditions. Naturally, therefore, Georgia's organs of leadership will pass an appropriate decree to ensure implementation of the CPSU CC and USSR Council of Ministers decree, on the one hand, and promote full utilization of the republic's scientific potential and technical base, on the other.

Of these tasks, we deem it essential to carry out the following measures.

The GSSR Academy of Sciences and State Committee for Science and Technology must:

Create, as soon as possible, a republic interdepartmental council for physical-chemical biology and biotechnology, on the base of the present interdepartmental council for molecular biology and molecular genetics, which has already done excellent work;

The basic directions in physical-chemical biology and biotechnology must be mapped out, with the appropriate departments participating, and on this basis a unified, integrated-goal-directed program must be drawn up;

Allocate 30 to 40 staff slots annually for the development of physical-chemical biology and biotechnology in the republic, also 5 to 7 graduate school places;

Take appropriate steps to arrange the long-term (up to one year) assignment of three to four pr ; young scientists annually to world-renowned scientific centers.

The GSSR Academy of Sciences must:

In the next elections examine the question of opening two corresponding-member vacancies in Physical-Chemical Biology and Biotechnology;

Direct the Plant Biochemistry Institute to prepare an auxiliary college-level biotechnology text in the Georgian language, about 20 authors' sheets in length [avtorskiy list], by the end of 1982;

Set up a permanent 4-month biotechnology refresher course on the base of the Plant Biochemistry Institute, to accommodate 10 to 15 sector institute staff members annually;

Introduce the specialty rubric "Biotechnology" in the Academy's BYULLETEN' (Seriya biologicheskaya);

Raise before the GSSR State Committee for Science and Technology the question of setting up a 10- to 12-member central information group in the Scientific-Research Institute of Scientific-Technical Information and Technical-Economic Research to promote the development of physical-chemical biology and biotechnology in the republic by providing timely and up-to-date information;

Raise before the USSR Ministry of Higher and Secondary Specialized Education the question of training students in physical-chemical biology and biotechnology in the Tbilisi State University's Biology Faculty.

The Georgian V. I. Lenin Polytechnical Institute and the Georgian Agriculture Institute's rectorates must examine the question of introducing a special Biotechnology course in their respective faculties.

The GSSR Academy of Sciences Central Scientific Library and other appropriate libraries in the republic must make maximum effort every year to acquire foreign journals and books in physical-chemical biology and biotechnology.

GSSR Gosplan and the Finance Ministry must study the following questions:

Forms of material participation by republic ministries (agriculture, fruit and vegetable raising, food industry, health, and so on) in measures to develop physical-chemical biology and biotechnology;

The construction of an experiments building for the biophysics sector of the I. Beritashvili Physiology Institute and an enzyme compounds production shop for the Plant Biochemistry Institute.

GSSR Gossnab must pay particular attention to the task of supplying the necessary equipment, instruments, reagents, and other materials for the development of physical-chemical biology and biotechnology in the republic.

The development of physical-chemical biology and biotechnology on a high scientific level in Georgia is a difficult problem involving many ministries, committees, departments, and scientific establishments. The suggestions presented here constitute just a few of the measures that are necessary. Scientists, scientific organizers, and production executives will undoubtedly have more to add to these "measures."

6854
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MOLDAVIAN CENTRAL COMMITTEE URGES INCREASED S&T EFFORT IN AGRICULTURE

Kishinev SOVETSKAYA MOLDAVIYA in Russian 6 Oct 81 p 1

[Report: "In the Moldavian Communist Party Central Committee"]

[Text] The Moldavian Communist Party Central Committee has examined the question "On the Status and Measures for Further Increasing the Effectiveness of Scientific-Research in Biology and Introducing its Results into the Republic Economy."

The decree adopted notes that the Academy of Sciences, ministries and agencies, scientific-production associations, and higher educational institutions of the Moldavian SSR in recent years have done certain work to further increase the effectiveness of research in biology and to utilize its achievements in the economy. With the aim of raising the level and bringing biological research closer to the needs of the republic economy, there has been a reorientation of research areas, a reorganization of the structure and staffs has been brought about, the experimental-production base for scientific institutions has been strengthened, and scientific potential has been concentrated on the development of the most important problems that have significance for the economy.

At the same time, the scale and level of development in biological science does not respond to the growing requirements of agriculture, industry, and medicine. The utilization at the present time of intensive methods of conducting the economy involves the aggravation of environmental pollution. The application of a large quantity of chemical preparations leads to the reduction of potential soil fertility, increased mineralization of water, and a lowering of the biological value of food and forage plant products.

The republic has unsatisfactory rates of development in research in the fields of physical and chemical biology and biotechnology, the development of new, effective methods of plant and animal selection, the organization of large-scale, ecologically sound associations for agricultural crops, and the conservation and rational utilization of natural resources. The development of biology is being held back because of the underestimation in a number of scientific institutions of the role of theoretical research, because of poor provision of up-to-date instruments, equipment, and chemical reagents, and because of unsatisfactory fulfillment of plans for the construction of the proper experimental-production base. The possibilities of modern physics,

mathematics, and chemistry are still poorly utilized to increase the effectiveness and raise the level of biological research. The ties between theoretical and applied research remain insufficient, and this has decisive significance for securing high rates of scientific-technical progress in the economy.

Gosplan, ministries, agencies, and scientific institutions of the Moldavian SSR do not fully utilize the advantages of the special-purpose program method in planning, coordinating, and conducting complex research in the field of biology, especially during the stages related to practical implementation of the results achieved. Often, scientific developments are proposed for utilization in the economy without having undergone experimental-industrial testing and without the necessary technical-economic substantiation.

Interagency complex research on the most important problems of contemporary biology is not supported to the necessary extent by special-purpose financing and supply and equipment support, and this adversely influences the effectiveness of the work of head scientific institutions, which are responsible for the quality of scientific research and timely introduction of its results into production.

The higher educational institutions of the republic make extremely poor use of the scientific potential and experimental base of the Moldavian SSR Academy of Sciences for training specialists in biology. Individual scientific units are experiencing critical shortages of personnel with higher qualifications.

There are serious omissions in the activities of party organizations of scientific institutions and higher educational institutions in the mobilization of communists' efforts to increase the effectiveness and quality of scientific research and in the selection, placement, and appointment of personnel and in their political and ideological training.

With the aims of further increasing the effectiveness of biological science and of strengthening its relations with the republic economy, the Moldavian Communist Party Central Committee considers the most important task of Gosplan, the Academy of Sciences, ministries, state committees, agencies, scientific-research institutions, enterprises, and farms in the Moldavian SSR to be the fulfillment of the requirements of the 26th CPSU Congress for accelerating the rates of scientific-technical progress, a rise in the level of fundamental and applied research, and basic improvement in the introduction of biological science achievements into the economy.

The Moldavian Communist Party Central Committee proposed that Gosplan, the MSSR Academy of Sciences, the Republic Council for the Coordination of Scientific-Technical Problems Between Economic Sectors, ministries, state committees and agencies, scientific-research institutions of the republic concentrate scientists' efforts on first-priority solution of problems in the agroindustrial food complex, giving special attention to developing biological bases for adaptive agricultural systems under intensification and large-scale concentration, including the development of highly productive energy-saving technologies, principles of organizing large-scale ecologically sound associations for agricultural crops, optimum agroclimatic macro- and microregionalization, and environmental protection under conditions of intensification in industrial and agricultural production.

It is necessary that Gosplan, Gosstroy, and the MSSR Ministry of Construction provide for the timely fulfillment of the construction plan for the biological center of the MSSR Academy of Sciences.

MSSR Gosplan is to examine, during 1982-1985, the apportionment of limits for labor and material resources with the aim of ensuring all-out development rates for biological institutions that operate under cost accounting, including the creation of new planning-technological and design bureaus and the expansion of old ones, and experimental facilities to develop physiologically active substances and to produce instruments and equipment for physical and chemical biology and biotechnology.

The MSSR Academy of Sciences, the MSSR Ministry of Agriculture, the MSSR Ministry of Fruit and Vegetable Farming, and republic higher educational institutions have been given the assignment of studying the question of introducing new forms of organizing research and the educational process by means of creating an interagency scientific-educational and production complex, bringing together the training of scientific personnel, the conduct of research, and the introduction of its results into production.

The ministries, state committees, and agencies of the Moldavian SSR, by 1 March of each year, are to submit to MSSR Gosplan, proposals for enlisting republic scientific institutions in the solution of important complex scientific problems that offer prospects for the development of the agroindustrial sector and medicine in the republic. MSSR Gosplan, together with the MSSR Academy of Sciences and the Republic Council for the Coordination of Scientific-Technical Problems Between Economic Sectors, is to examine the proposals submitted and, in consideration of their significance, to provide for the inclusion of appropriate tasks for scientific and higher educational institutions in plans for the development of science and technology.

The MSSR Academy of Sciences and the MSSR Ministry of Higher and Secondary Specialized Education, on the basis of generalizing the proposals of republic ministries and agencies, is to submit within six months, substantiated measures providing for expansion in the network of biological scientific institutions and for the establishment of new specialties for training personnel, with consideration of the requirements of science and of the republic economy.

It is necessary for Gosplan and the ministries and agencies of the Moldavian SSR to increase the sense of responsibility among managers of enterprises and organizations for fulfilling the recommendations of scientists in mass production, for fulfilling plans for the introduction of new techniques and technology, and for ensuring accounting for the economic effectiveness from the introduction of scientists' proposals. They are to provide for the timely formation of order-plans for science production and for the approval of interagency and economic-sector plans for scientific research and experimental-design projects and also for long-term scientific-technical forecasts.

MSSR Gosplan, party gorkoms and raykoms, the MSSR Academy of Sciences, and republic ministries and agencies must improve work in the selection, placement, and indoctrination of scientific-teaching personnel and improve as much as possible the ideological and political education work in collectives. They must practice more widely the

training of scientific personnel through formal special-purpose postgraduate programs and make better use of the possibilities of field assignments of scientific workers at the country's leading scientific centers. The MSSR Ministry of Higher and Secondary Specialized Education, the MSSR Ministry of Agriculture, the Kishinev Agricultural Institute imeni M. V. Frunze, and scientific institutions, with the aim of improving the training of biological specialists, must adopt measures for more widely enlisting leading scientists from scientific-research institutions in the presentation of special and standard courses, in directing diploma projects and students' production practice training.

MSSR Gosplan, the MSSR Ministry of Finance, MSSR Gossnab, and republic ministries and agencies are to adopt measures for the timely financing and supply and equipment support for complex research of regional significance, to increase the allotment for contractual subject matter, to allot the necessary funds for the construction of experimental-production bases for scientific institutions and for the strengthening of supply and equipment support for farm bases.

Party gorkoms and raykoms and party organizations of scientific-research and higher educational institutions should raise the personal sense of responsibility among managers and communists for the accomplishment of tasks relating to scientific-technical progress. They must achieve the state whereby each scientist continuously experiences the feeling of a high degree of responsibility for the quality and effectiveness of his own work and for the timely introduction of scientific results into production.

It is proposed that MSSR Gosplan and the MSSR Academy of Sciences study the question of creating appropriate bases in the republic for the provision of supplies and equipment to biological research and of organizing a network of independent design bureaus and experimental shops for biological instrument making and to make the appropriate proposals to the MSSR Council of Ministers by 1 September 1982.

Gosplan, the Academy of Sciences, the Ministry of Agriculture, the Ministry of Higher and Secondary Specialized Education of the Moldavian SSR, and the Kishinev Agricultural Institute imeni M. V. Frunze are to inform the Moldavian Communist Party Central Committee by 1 February 1983 as to progress in fulfillment of the present decree.

9645
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SCIENTIFIC RESEARCH DEPARTMENTS AT KIEV STATE UNIVERSITY EMPHASIZE BASIC RESEARCH

Kiev RADYANS'KA UKRAYINA in Ukrainian 19 Sep 81 p 2

[Article by M. Bilyy, rector of Kiev State University imeni T. G. Shevchenko]

[Text] Where does the path to large-scale science begin? Having asked this today of our eminent scientists, of course we received various replies. And yet, I am deeply convinced, most of them are sure to mention their student days. And this is natural, for in student days never-to-be-repeated a longing for scientific research starts to awaken and the creative talent of young people starts to be formed and spread its wings, strengthened with knowledge. The task of the higher school is to actively contribute to the development of the capacities of the student youth, to educate specialists with thorough theoretical and professional preparation. The collective of Kiev University aspires to precisely this in its everyday work.

Science can and must be an effective form of training of specialists. Life itself convinces us of this. But nothing raises a student in the eyes of his comrades, nothing helps him to "grow up" on the scientific level, as participation in scientific research work, serious and of practical importance. An economic effect of 51.6 million rubles has been obtained from the introduction of the results of scientific investigations conducted by the collective of the university in the past Five-Year Plans. It is gratifying that there is some participation of the efforts also of students in the attainment of that indicator.

The obvious improvements in the results of university science are connected with the creation of the scientific research part. This made it possible to unite and coordinate the efforts of scientists in the areas of both scientific and educational work. True, not all the problems have been solved there. Questions of the categorical nature of the scientific research part remain unsolved as well. We hope that the Ministry of Education of the republic will help us in solving this.

The university is now conducting scientific investigations in 31 basic disciplines. They have been developed with consideration of 41 specialties for which students are being prepared in our country. I would like to emphasize our increased attention to basic research which, in fact, has always been characteristic of the activity of universities of the country. Such attention, we note, helps to assure university a basic character in the training of students--the future specialists.

On the other hand, expansion of the front of basic research raises the theoretical level of applied developments. And this is a proven way to further strengthen the

the relations of science with the academic and branch science, with production. Thus, Kiev University has for a long time been working in a close interaction with the Academy of Sciences of the republic and many enterprises and establishments. Using this collaboration, we widely attract creatively working scientists and skilled workers of production to lecture to students. Eighty-five specialists from the UkrSSR Academy of Sciences and other enterprises and establishments are conducting wide educational work in the university. In our view the VUZ's must be given the right to solve themselves questions of the advisability of such pluralism.

Also completely justifying itself is the transition of other educational institutions to the complete training of specialists for those enterprises and establishments with which they are successfully developing creative scientific contacts. At Kiev University a number of faculties, primarily of the natural sciences (cybernetics, physics, radiophysics, chemistry) have entered into agreements on the complete preparation of specialists in the Eleventh Five-Year Plan. What does this offer? I will cite the main advantages. It opens up the possibility of conducting the educational process while taking the demands of specific enterprises into consideration, making wide use of their material base and actively attracting to the educational work the leading production specialists. These advantages are especially notable in the activity of educational-scientific-production associations.

Kiev University participates in the work of three educational-scientific-production associations: "Elektronika," "Chistaya Voda" and "Geodezkart." In addition, in the "Chistaya voda" Association, besides scientific development work the university prepares chemical specialists for the enterprises participating in the association. For this a new specialization has been created in the chemistry faculty, "Water Chemistry and Engineering." Also contributing to the complete preparation of students is the formation of basic departments, department affiliates and laboratories at enterprises and in academic institutes. In the presidium of the Academy of Sciences of the republic the question of whether Kiev University will be the main one in the preparation of specialists for the UkrSSR Academy of Sciences is now being decided.

Life shows that the complete preparation of specialists is promising and necessary and, in addition, related to the acute problem of manpower. In connection with that I would like to point out that the time has already arrived for the UkrSSR Ministry of Higher and Secondary Specialized Education to legalize direct agreements between higher educational institutions and establishments for complete preparation of specialists. Then such agreements would have a realistic basis and acquire legal force in the higher school.

Of exceptional importance for the development of creative talents and habits of future specialists is the research work of students. It is provided for at the university by the plans of all profiling and graduating departments (in a volume of 400-500 hours) as a component part. The main thing in this system is the fact that from the first day of study at the university each student systematically engages in scientific research work and actively continues it after concluding his studies at the VUZ.

One of the most widespread and effective forms of such work is the creation of scientific collectives of students and instructors, united by mutual creative interests. Now more than 60 percent of our students are doing collective scientific work. Thus,

in the Philology Faculty a problem group is functioning which is engaged in investigations of the figurative poetic word on the pages of the front and partisan press. A result of its activity is a unique catalog of literary publications on the pages of the front press (nearly 55,000 units).

It is interesting to point out that in a number of cases student scientific groups are laying a firm foundation for the creation of research collectives in place of further work of graduating students. Thus, on the basis of student problems of groups in the radiophysics faculty, independent scientific collectives have been formed of radiophysics specialists and physicists who are successfully continuing to work at enterprises and in establishments which are a part of the "Elektronika" Educational-Scientific-Production Association.

A logical continuation of the research work of students and an objective criterion for evaluating its quality are the various competitions, olympiads, exhibitions, etc. The achievements of the educators of Kiev University are generally known. It is indicative that the number of collective student works submitted in competitions is increasing, especially in the area of the social sciences. Thus, among the works prepared by students of the university for the Eighth All-Union Competition of the Social Sciences, nearly 50 percent were collective investigations.

Certainly it is necessary that the students, especially of the senior courses, conduct current investigations on realistic themes on an equal level with instructors and staff scientific collaborators. We are convinced that the best results will be obtained if the young men and women take part at first in discussions and theoretically substantiated tasks, and then, in all stages of the work, up to the preparation of an experimental installation, construction of a prototype and its introduction into production.

This will give a twofold effect. On the one hand, a real saving at enterprises which will amount to hundreds of thousands of rubles, the publication of monographs, the defense of dissertations, etc. These are only examples. The results of the research of student V. Volovyk entitled "Influence of admixtures on properties of noble metals" have been introduced at the Kiev jewelry plant. The saving amounts to 107,000 rubles. Summaries of the work of groups of instructors and students of the Biology Faculty have found reflection in practical recommendations and a collective monograph entitled "Budova funktsiyi i yevolyutsiya geniv" ("Construction of Functions and Evolution of Genes").

On the other hand, there is improvement of the educational process in the course of which the education of capable experimenters and specialists is assured, of persons who are able to use obtained knowledge with the greatest advantage for practice.

If we take into consideration that besides all the rest graduates of the higher school must be capable managers and organizers of labor and scientific collectives, it is advisable to give more attention to the mastering by students of habits of organizational work. Unfortunately there still is a perceptible gap and sensitive places in the preparation of our specialists, although the VUZ's are making specific efforts in this direction.

I would like to also emphasize that the interrelation of scientific research work with the educational process fundamentally influences the scientific status of the

instructor, who is transformed into an active scientist who performs in relation to the student the function of a highly qualified consultant. The active participation of the instructor in practical research activity is a stimulus to his continuous growth on the scientific level and a means of productive implementation of new knowledge accumulated by him.

Usually the achievement of a real unit of scientific and educational work in the VUZ is a lengthy and complicated process, one which requires a real reconstruction of the entire educational process. However, life itself requires such a reconstruction.

The new school year has started. The 30,000 collective of Kiev University is urgently working these days to accomplish the increased socialist obligations assumed in response to the resolution of the Central Committee of the Communist Party of the Ukraine, following the initiative of a number of VUZ's of the republic to widen the competition under the slogan, "Creative union of higher school and production--in the service of the Five-Year Plan." Our pledges for the present Five-Year Plan envisaged: producing in the national economy over 700 completed developments with an economic effect of over 70 million rubles and preparing from among co-workers of the university 77 doctors and nearly 1100 candidates of sciences. We expect and we are convinced that in the attainments referred to our student youth will contribute a weighty portion. But the student years are a wonderful time for creative daring, for the first searches and discoveries.

2174
CSO: 1811/4

LEVEL OF S&T WORK IN UZBEKISTAN CALLED UNSATISFACTORY

Tashkent EKONOMIKA I ZHIZN' in Russian No 5, May 81 pp 42-46

[Article by T. Khankhodzhayev, chief of the science section of the UzSSR Committee for People's Control and a candidate of economic sciences: "Put All Scientists' Efforts on the Solution of Key Problems of the Economy"]

[Text] The 26th CPSU Congress, in outlining a far-reaching program for the social and economic development of the country in the 1980's, gave an enormous amount of attention to the further development of science. "No one needs convincing as to the great significance of science," stressed Comrade L. I. Brezhnev. "The party of communists proceeds from the assumption that the building of a new society without science is inconceivable."

Actually, the practice of creating communism convinces us more and more that science is becoming a direct productive force and that its fruitful influences are literally felt in all sectors of the economy. This is aided in all possible ways by our socialist state, which wisely provides material resources, money, and personnel to scientific institutions.

In Uzbekistan, as in the country as a whole, the network of scientific-research institutions is constantly expanding; in them today there are almost 35 thousand scientific workers, including over 900 doctors of sciences and about 13 thousand candidates of sciences. In recent years, the supply and equipment base for scientific institutions has been significantly strengthened. Certain experience has been accumulated in the creation and successful operation of scientific-production associations.

Scientists of the republic are taking part in the development of over 40 scientific-technical problems within the framework of country-wide division of labor. The research that has the most important significance is that being done in the fields of mathematical statistics, electronics, bio-organic chemistry, genetics and selection, and also the chemistry of alkaloids. Our scientific institutions yearly provide the economy with hundreds of scientific-technical developments, with an economic effect exceeding 500 million rubles. An especially tangible contribution is being made by the collectives of the institutes of chemistry, nuclear physics, cybernetics, experimental plant biology, and several other institutes of the UzSSR Academy of Sciences. Thus, in 1980, the return for one ruble's expenditure for the Institute of Cybernetics was 5 rubles 70 kopecks, and for the Institute of Chemistry,

8 rubles 20 kopecks. The introduction of only one development by the Institute of Chemistry -- "UDM" defoliant -- provides over 20 million rubles' savings annually.

Many important and needed scientific developments are completed and handed over for introduction into production to ministerial scientific-research institutes and higher educational institutions of the republic.

"All this does not mean, of course," as Sh. R. Rashidov noted at the 20th Uzbekistan Communist Party Congress, "that the activities of scientific institutions are free from defects. For example, the level of scientific developments and introduction of finished research into production still cannot satisfy us."

The point is that the efforts of science today must be still more concentrated on key economic problems, and some scientific institutions still give insufficient thought to planning their research and often do not take the requirements of production into account. Therefore, plans contain petty subject matter and the duplication of some developments, which leads to the scattering of scientific efforts and material resources.

There are cases where scientific developments are not fulfilled within the established schedule and some of them are transferred from five-year plan to five-year plan by means of slight changes in titles. Individual instances are encountered of the disruption of state discipline in the utilization of material resources and financing which, of course, does not help increase the effectiveness of scientific work.

During the last two years, the republic Committee for People's Control has examined the activities of a number of scientific institutions, including the institutes of electronics, physico-technical sciences, and biochemistry of the Uzbek Academy of Sciences, the Central Asian Scientific-Research Institute of Forestry, and certain experimental stations and branches of the All-Union Scientific-Research Institute of Cotton Growing (SoyuzNIKhI).

In the electronics and physical-technical institutes, for example, there is a lack of needed verification of the necessity for including certain research topics in the plan. External review of draft plans for scientific research is not practiced: there is practically no patent-license review of the subject matter or economic substantiation of plans, as there is no conjugate research and analysis of the activities of leading foreign firms or, also, comprehensive study of the specific requirements of the republic economy.

Is that why, during the last two five-year plans, scientific-research plans of these two institutes have not included extremely important research on the complex problem of transforming solar energy into electricity? On the other hand, in yearly and five-year plans, one can find many tasks that are general and lacking in specificity, which is evidence of how poor the ties are that institutes have with ministries and agencies and how poor the information service is to scientific laboratories.

The 20th Uzbekistan Communist Party Congress gave perfectly clear directions that scientific developments be oriented toward special-purpose complex programs flowing from Uzbekistan's place in the country-wide division of labor and from the needs of the republic. But, in the institutes mentioned, the formulation of the problem-topic plan often takes place without considering these requirements. That is probably why the "Cotton Physics" laboratory of the Institute of Electronics, instead of

research on the physical properties of raw cotton, has been working for a number of years on tasks that have no direct relationship to the subject. This laboratory for 10 years has conducted work on determining the type and moisture of cotton and on its processing but has not once coordinated its actions with the head institute for the cotton industry, the Central Scientific-Research Institute of the Cotton Industry.

Some scientific institutions not only do not take effective steps to reduce the time taken for more economically important developments and to make them cheaper, but even frustrate the planned schedules. Thus, the physico-technical institute, since 1975, has not accomplished the fulfillment of tasks from directive bodies for the preparation of a portable solar distillation device for production. The models that have been created are not very suitable for industrial production, and the preparation of a new distiller design for examination by an interagency commission has dragged on intolerably. Here is another case. As early as 1974, the institute was given the task of testing a solar refrigerator it had developed. A complex program for the 10th Five-Year Plan provided for developing the operational documentation for the refrigerator by 1978 and to fabricate an experimental model of it. However, this task was not accomplished.

Many serious defects have been revealed also in the organization of contractual scientific research. Insufficiently clear planning of such projects and expenditures on them leads to a situation where the planned amounts of research financing substantially differ from the actual amounts. In this connection, there is an excessive growth in the proportion of contractual projects that are small and have little significance. At the physico-technical institute, for example, 10 out of 16 contractual projects constitute, in all, 24 percent of their total volume.

The 26th CPSU Congress demanded improvement in the organization of the whole scientific-research system. "This system," said Comrade L. I. Brezhnev, "must be significantly more flexible and mobile, intolerant of unproductive laboratories and institutes." But we still have them. It is difficult, perhaps, to call the laboratory of the physics of cotton of the Institute of Electronics anything else but unproductive, as it was able to carry only one of its seven contractual projects through to introduction into production. And yet, 870 thousand rubles were spent on research!

Often, the chief reason for delay and, at times, also for the impossibility of introduction of scientific developments into production, is their noncompletion. This takes place when scientists solve only part of a complex problem. Thus, the physico-technical institute, having done research on the possibility for sundrying fruit, proposed to accomplish this in practice. But what the optimum design and parameters of the driers should be and how the whole drying process could be mechanized -- these and other questions remained unanswered.

The instruments and devices being developed by scientists, as a rule, are not being certified and are not being recommended for serial production. Can it be considered normal when, out of 33 developments by the physico-technical institute, only one has been included on the register of the State Committee for Standards? Of the 12 laboratories of the Institute of Electronics, only three are engaged in the introduction of results of scientific research into production. The situation at the Institute of Biochemistry is still worse; its managers are evidently little concerned with the end results of the collective's activity.

The situation is unsatisfactory with respect to the calculation of economic effectiveness and to the formulation of the respective documents for the introduction of finished projects. You see, analysis shows that the average economic effectiveness for the Institute of Electronics during the last three years has been 34 kopecks per ruble of expenditure. For the Institute of Biochemistry, this indicator is still lower. Danger signals! The attention of the economic subunits of the institutes, which are still performing their functions poorly, should be riveted to these danger signals.

The introduction of scientific developments into production is the decisive and most urgent sector today in the struggle for the acceleration of scientific-technical progress. And, naturally, much here does not depend on scientists. Economic managers often do nothing about unjustified delay. Many instances can be introduced where developments recommended for introduction do not find application through the fault of certain of our ministries and agencies.

This same physico-technical institute, as early as 1974, turned the UDT-1000 stationary water distiller, which it had developed, over to an interagency commission. With respect to building and testing this equipment, the appropriate decisions were made, and definite instructions were issued; however, there are still no distillers. And the blame for this must be borne by the republic ministries of agriculture and rural construction.

On instructions from directive bodies of the republic, the Institute of Biochemistry developed and proposed to introduce methods for preincubation radiation of eggs with small doses of gamma rays and for feeding spirulina to fowl. The introduction of both methods promises to raise the productivity of poultry farming and to achieve a yearly economic effect of about four million rubles. All of this future introduction, including draft documentation for the construction of needed buildings, but the UzSSR Administration of the Poultry Industry, for some unknown reasons, is still delaying decision of the question, showing utter disregard for science.

Sometimes, our economic managers lack the desire and ability to seek advice from science at the early stages of cooperation. The Ministry of the Cotton Processing Industry, for example, does not participate actively enough in formulating joint complex plans for scientific-technical developments with institutes. Therefore, it also happens that plans include developments without sufficient verification for it and essentially without good prospects. As a result, state funds are spent for nothing. For such research as this, the Institute of Electronics spent 470 thousand rubles on the complex "Cotton" problem. But, since the development provided no effect, the UzSSR Ministry of the Cotton Industry simply cut off the financing.

One of the reasons for the sometimes low effectiveness of scientific research is the lack of control over activities of individual collectives of scientists, and from this comes their lack of responsibility for the assigned mission and the absence of proper comradely discipline, criticism, and self-criticism. All this, perhaps, can be applied with good reason to the collective of the Central Asian Scientific-Research Institute for Forestry, which for many years has not provided the necessary output.

Of 38 topics being worked on by the institute, six have been included in the subject plan for several five-year plans, because of systematic disruptions of the periods

of fulfillment. Research on the topic "Complex Mechanization of Work in Sand Deserts" has been conducted by the section on mechanization of forestry since 1965, and about 300 thousand rubles have been spent on it. Research by the section for forestry economics and management on the development of standards for increasing the yields of important agricultural crops has been conducted throughout the years of the 10th Five-Year Plan and now has been included in plans for the 11th Five-Year Plan. The work program and research methodology have been copied entirely from one year to the next without any changes. Already, 180 thousand rubles have been spent and another 150 thousand rubles are planned. But there are still no forestry standards. Research on the topic "Development of a Complex of Machines for Irrigated Nurseries for 1971 to 1975" turned out to have been wasted, although 100 thousand rubles were spent on it.

And, finally, one more case. The sector for forest selection has conducted research since 1966 on the topic "Selection and Testing of Nut-Bearing Varieties in Central Asia," on which 486 thousand rubles have been spent. However, the chief aim of the research -- the introduction of valuable new varieties of walnuts -- was not achieved, and this topic again has been planned for the 11th Five-Year Plan. They want to spend an additional 180 thousand rubles.

In all, at this institute over the last ten years, ineffectual expenditures have exceeded a million rubles. Here we have a genuinely unproductive institute! And it is not understandable why high-level administrative bodies are so indifferent to "activities" of this collective.

A large contribution to the development of urgent scientific problems in agriculture is being made by the collectives of the All-Union Scientific-Research Institute of Cotton Growing (SoyuzNIKhI) and the scientific-production association imeni Academician Shreder, which are well-known not only in the republic but also in the country as a whole. But even there, some of their branches and experimental stations are working essentially without control and without full output. And this causes large losses, if one considers that Soyuz NIKhI has 13 branches and experimental stations and the association imeni Shreder has 22.

The subject plans of the SoyuzNIKhI branches and experimental stations often do not show the development time periods, the anticipated results, or the amount of financing. Estimates of expenditures are not made in them, and actual expenses are not accounted for. Thorough analysis of the work of the Kashka-Dar'ya branch and the Bukhara experimental station of SoyuzNIKhI shows that scientific projects there are not fully fulfilled and contain deviations from the program and methodological errors and that, in many instances, the experiments conducted do not achieve their aim. This means that the expenditures for them are often not justified.

There are serious shortcomings by the branches in the fulfillment of contractual scientific-research work. In this connection, as a rule, there is no separation in expenditures between budgeted projects and contractual projects. Meanwhile, at the mountain-horticulture branch of the scientific-production association imeni Shreder, a two-year plan for contracts in the sum of 28.3 thousand rubles came to naught, and the wine-making branch of the same association fulfilled roughly a third of the plan for contractual work during the last two years.

The collectives of the branches and experimental stations are little concerned with the introduction of the results of completed research; they do not formulate their

reports in the established format; and they do not calculate effectiveness. Certain branches and experimental stations of SoyuzNIKhI do not even have plans for introduction. The existing economic section at the Samarkand cotton-growing experimental station is not involved with the effectiveness of scientific research. Here and there, developments remained uninterested but, in a number of cases, because of the lack of technical-economic substantiation of the research being conducted, the assumed effectiveness from the introduction of products is grossly overstated.

The status of the experimental farms of a number of branches does not meet standard requirements. The low level of planning of the basic indicators for branches and experimental stations on the part of SoyuzNIKhI, which are the basis for developing the industrial-financial plan, has led to the situation where at experimental farms, particularly at the experimental farm of the Golodnaya Step' branch of SoyuzNIKhI, the cost of products being realized exceeds the planned cost. More actually, the cost per center of raw cotton is 16 rubles higher than the planned cost, and at the Fergana experimental station of the same institute, it is 35.6 rubles higher. At the Samarkand Experimental Station for Cotton Growing, the cost of products realized last year exceeded planned cost by 260.4 thousand rubles.

In eliminating the many shortcomings that exist in the work of scientific institutions, significant aid is being given by republic bodies for people's control. Special attention is given to the control of effective utilization of material resources and funds. And this is not without, because in a number of scientific institutions, instances of poor management and wastefulness have not been overcome.

Recently, the UzSSR Committee for People's Control (Komitet narodnogo kontrolya) at one of the subunits of the Institute of Seismology of the republic Academy of Sciences, verified the use of state funds allotted for the development of science. Similar instances have occurred at the Central Asian Scientific-Research Institute of Forestry and at branches and experimental stations of SoyuzNIKhI and the scientific-production association Ispol Sredstv.

At the 26th CPSU Congress, Comrade L. I. Brezhnev specially pointed out that "not one violation, not one instance of abuse, waste[fulness], or lack of discipline should escape the rigorous watch of people's controllers." This instruction should invariably guide all people's control bodies, including people's control groups and posts in scientific institutions. Much of their activities shows that people's controllers do much that is useful in fighting against instances of irrational utilization of material and financial resources and in preventing various types of violations.

In this connection, a positive evaluation can be given to the work of the people's control groups of the institutes of nuclear physics, mechanics, and earthquake-resistant construction, and geology and geophysics of the Uzbek Academy of Sciences, the Central Asian Scientific-Research Institute of Irrigation, and certain others. However, people's controllers must work more actively to eliminate the violations and shortcomings that exist in the activities of scientific institutions, particularly with respect to increasing the effectiveness of scientific research.

This is especially important today, when scientific institutions are actively work to give life to the well known decree of the CPSU Central Committee and USSR

Council of Ministers on the improvement of planning and management. This decree, in particular, provides for a whole system of measures directed at accelerating scientific-technical progress and expanding the output of new, highly effective products.

The transition of scientific-research, planning-design, and technological organizations, scientific-production and production associations (enterprises), as well as industrial ministries to the cost-accounting system of organizing work for the creation, assimilation, and introduction of new technology on the basis of commission-orders (contracts); the definition in these contracts of the end results of projects, the performers, and schedules for fulfillment at all stages -- from scientific research to the introduction of results into production: all of this creates reliable preconditions for really closing the gap between science and production, economically and organizationally.

The creation in ministries and agencies of a unified fund for the development of science and technology will help strengthen the experimental base at scientific institutions; the absence of or weakness in such a base today is a large obstacle to the introduction of scientific-technical developments. And material incentives for scientific workers, when their award is made directly dependent on the quality of completed work and on the total economic effect actually gained by the economy from the utilization of scientific and technical achievements, will increase motivation and responsibility toward the assigned work.

The task of Uzbekistan scientists now consists of consistently and completely putting into effect the system of measures developed by the party and government for increasing the effectiveness of production and quality of work, of responding to the party's fatherly concern for new scientific accomplishments, and of strengthening the union of creative thought and creative labor in every way possible.

Only under these conditions can the deficiencies revealed be eliminated and the task posed by the 26th CPSU Congress -- of moving all economic sectors to the advanced frontiers of science and technology -- be successfully accomplished.

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GEORGIAN CYBERNETICIST URGES CENTER FOR STUDY OF SCIENCE

Tbilisi KOMUNISTI in Georgian 26 Aug 81 p 2

[Text] The scientific-technical revolution today has given birth to a new branch of science, "naukovedeniye"[study of science]. It deals with matters of scientific functions and development, the organization of scientific efforts, the dynamics and structure of scientific cadres, and interacting spheres of the material and spiritual aspects of science and society.

Since science became a productive force it has become essential to study the structure and quantitative growth of scientific cadres, the search for optimal forms of organization of research, forecasting of scientific development and science funding, the psychological and sociological climate in the scientific collective, effective application of research findings to practical concerns, and effective administration of research planning and scientific-technical progress. To do this it has become necessary to use methods of quantitative and structural analysis. The study of "naukovedeniye" problems requires the participation of workers in organization theory, psychology, sociology, mathematics, and other fields.

Strangely enough, not much has been done along these lines in our republic even though Georgia is an outstanding region of scientific research in the Soviet Union.

The accountability report of the 26th GCP Congress briefly but clearly points out the lag in this regard that has developed in Georgian science.

To accelerate scientific-technical progress we must seek optimal means of scientific and production interaction. It is worth noting that exact methods of researching the "test-tube to tank" problem have been worked out in the field of "naukovedeniye," enabling us to analyze concretely the prospects for any particular research theme to be adopted in production.

In the Central Committee's accountability report to the 26th CPSU Congress, Comrade L. I. Brezhnev said: "It would be a good idea for the Academy of Sciences, the State Committee for Science and Technology, and the ministries to work on evaluating the scientific and design base of the various sectors and make recommendations as to some regrouping of scientist manpower." It is, indeed, an urgent problem to define criteria for evaluating a particular scientific or design organization, on the one hand, and regroup scientist forces in order to handle topical scientific problems in an effective manner. This requires the formulation of scientifically substantiated recommendations for each specific case.

It is clear, therefore, that life brings to the forefront the necessity of an integrated study of Georgia's scientific development (perhaps a department or sector on the base of a particular institute of the Academy or the State Committee for Science and Technology. Just such a center--a "Naukovedeniye" Sector--has been created under the Kiev Cybernetics Institute). The research findings of such a center would serve as the basis for any decision affecting scientific development in our republic.

Yes, the times themselves--today's era--raise the issue of the desirability of "naukovedeniye" development in Georgia and how to define its tasks.

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